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AMERICAN GAS JOURNAL

JUL 25 1936
PERIODICAL DIVISION

In Two Parts — Part One

THE STUFFING-BOX TYPE MECHANICAL JOINT. IT IS BOTTLE-TIGHT.

CAST IRON GAS MAIN LAID A CENTURY AGO. STILL IN SERVICE.

Modern production methods and metallurgical control, plus bottle-tight* mechanical joints in various designs as produced by C. I. P. R. A. members, make cast iron pipe contribute more than ever to efficient gas distribution.

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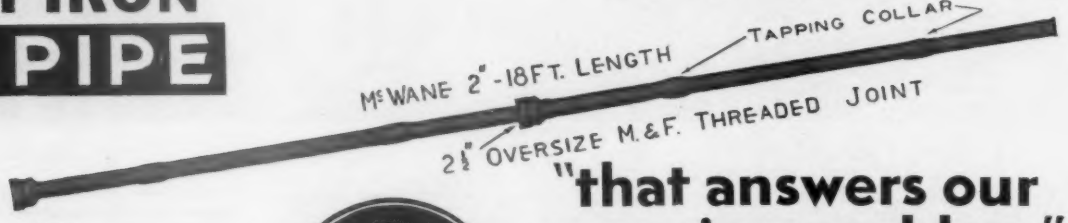

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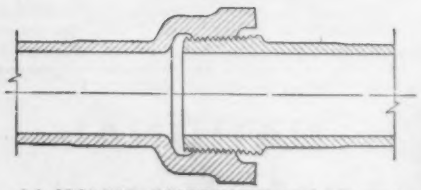

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New York, Chicago, Kansas City, Denver

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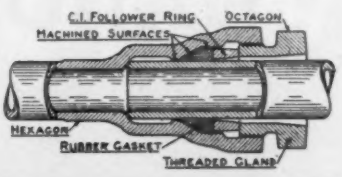
used in the line to provide expansion and contraction. Complete line of Glantite Fittings.



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Contents

Pipe Corrosion and Coatings—Erick Larson 7
Detroit Adopts New Rate Form 10
A Profit-Sharing Gas Rate—J. L. Underhill 11
As the Editor Sees It 12
Should "Mass Production" Methods Be Used in the Office—H. J. Johnson 13
Requirements Committees Act to Hasten Developments of Hair Dryer Standards 14
Ford's Forging Furnaces—J. B. Nealey 15
Review of Principles of Heat Transfer—Prof. C. C. Furnas.. 17
Validity of Gas Franchises—Leo T. Parker 21
Research In Public Relations—Clark Belden 23
Unique Sales Contest—R. S. Ellsworth 26
Gas House Heating Sales Methods and Results—Henry J. Mandel 28
Trends in Lower Oven Cooking Temperatures—F. R. Wright 30
Metropolitan Utilities District of Omaha Spends $6,000 For Display Rooms—Charles P. Rodman 31
Selling Hot Water By the Gallon—R. N. Hill 32
Home Service Activities 37
The Mystery Chef Radio Program—Charles W. Person..... 38
News of the Gas Industry 40
Special Rate Plans and Rate Applications 52

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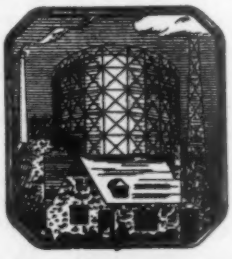

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JULY 1936

AMERICAN GAS JOURNAL

VOLUME 144 NO. 7

Pipe Corrosion and Coatings

By

Erick Larson

Gas Engineer

Part I

INTRODUCTION

Evasive Gas Enemy No. 1—"Costly Corrosion"—has gradually acquired a reputation so extensive only a few Gas Men are intimately aware of the havoc and ruin in his wake. His pass word is Destroy steel! Destroy cast iron! Destroy wrought iron! Destroy alloys! Gas Men have become familiar with the reasons for the enemy's attacks, the elements used, the methods followed and many personal traits of the vicious character now and know the most effective weapons for combating his destructive forces.

How often we are faced with the problems of determining a practical corrosion policy! There is no one answer. An old line is being replaced. What degree of corrosion protection should be applied? Will the new pipe repeat the life record of the replaced main? Many factors may alter past performances. What are these factors? Where may they be sought? How may they be determined? What is their relative importance? How may existing policies be applied to virgin territory? When necessary what coatings should be used? Are there degrees of protection? Will any one coating protect against all types of corrosion? How may the protective value of a coating be determined? Should coating be field, central station or mill applied?

Erick Larson

These are but a few of the general questions confronting the executive deciding a corrosion policy. Others must travel through myriads of details to obtain facts from which policies are determined. Those who have traveled the road of experience have acquired many simple effective solutions to corrosion problems.

The object of this series of articles of which this is the first, will be to present a complete resume of the methods and practices which scientific research and practical experience have developed and time proved effective.

General

MAINS and services command the attention of the gas industry because the use of pipe for these purposes represents approximately sixty to almost ninety per cent of the investment on individual systems. The tremendous investment in pipe lines directs the gas engineer's attention to the value of prolonging pipe usefulness both for economy and conservation of natural resources. At present ferrous ores are the major source of supply for pipe lines. There is a vast supply of iron ore which constitutes the basic supply of metal for gas and numerous other industries. The supply is not unlimited and deliberate waste would eventually lead to dependence upon foreign sources which is undesirable. Contemplation of the need for a foreign supply is futuristic and, therefore, consideration by the gas industry is not a pressing economic necessity. Conservation, however, is a duty owed to future generations as a mark of appreciation for the many conveniences enjoyed today as a result of past preservation of natural resources and in recognition of experience with non-conserved resources. Many minimize the problem of conservation claiming individual uses are infinitesimal when considering the vast stores of iron ore known to exist. However, less than a century ago the available supply of timber was considered inexhaustible, but the wanton waste by numerous large and small consumers has resulted in a shortage which materially affects present prices. Iron is a basic necessity and its lack would have an indirect effect in almost every phase of living.

Unless industry initiates, government will legislate conservation programs.

Conservation is both preventing the destruction of the various forms of metals after the ore has been processed and the use of metal in such a form that the maximum length of safe service is produced from the least quantity of metal. Conservation may include the use of lighter walled pipe and the substitution of steel for cast iron pipe where practical or vice versa. The increased strength and resistance to corrosion of some alloys compared to iron may lead to their selection as the pipe metal of the future.

Losses by Corrosion

Estimates have been made of the losses of ferrous materials sustained annually through destruction by corrosion, the most common of which is two per cent of the total tonnage in use including not only subsurface but all iron structures. The two per cent estimate indicates an average service of only fifty years which has been exceeded in a number of instances but at present unprotected buried steel lines are seldom predicted as having more than that period of potential life. The value of the material lost through corrosion in the United States has been placed at $100,000,000 annually. Other estimates indicate that approximately $35,000,000 of the above amount is the loss by corrosion in the gas and oil industries.

This estimated loss from corrosion in the combined oil and gas industries appears conservative when considering that the gas industry in the United States has approximately 200,000 miles of gas transmission and distribution lines and at least 72,000 miles of service pipe, representing a total investment of approximately $2,700,000,000. Replacing this tremendous investment would require more capital per unit installation than was initially necessary as material and labor costs have increased.

Estimating the average life at one hundred years and using installed unit cost figures will result in average replacement costs in excess of $27,000,000 annually. The industry must prepare for gradually increasing replacement expenses and continuity of the high expense after the peak has been attained depends upon the degree to which mains installed at present and in the future are protected from the ravages of corrosion.

Corrosion Interpreted

The term corrosion will be interpreted in its broadest meaning and include all factors entering into loss in value of a buried pipe due to the action of the elements. Electrolysis may not be construed as an element but without the natural elements surrounding buried structures, electrolysis would have no effect. Depreciation in value may be physical or economic in nature. Physical depreciation is the decrease in the quantity of pipe wall metal originally installed due to corrosion changing the form or position of the metal or erosion wearing metal away from the pipe. Physical depreciation may occur uniformly over the entire pipe surface or in localized areas where concentration usually intensifies the corrosive action and results in the formation of pits. Economic depreciation is the decrease in the value of a pipe line due to a lessening of its ability to safely convey gas to the full extent of its initial carrying capacity or its entire loss through the necessity for replacing the pipe because of corrosion or other causes. There is no direct correlation between physical and economic depreciation except at the time of installation and at the termination of usefulness after physical failure. The accountant is thus free to determine the means by which he will provide for the financing of ultimate replacements and it devolves upon the operator to maintain physical being in an economical manner. Physical depreciation does not include obsolescence, inadequacy or replacement because of interference with public works although in many cases they are of vital economic importance. In a discussion of corrosion, obsolescence, inadequacy or replacement before complete failure are factors where economy dictates the abandoning of a main in place before the expiration of its usefulness rather than recovery of the pipe in a condition to warrant its reuse. In gas transmission and distribution there is practically no internal wear on a pipe when wear is interpreted as actual loss of metal due to the passage of gas. Internal corrosion occasionally occurs but is more easily controlled than external.

Every type of unprotected metal in common use for pipe lines tends to physically deteriorate when buried. If it is desirable to decrease the rate of deterioration the buried metal must be isolated from contact with the soil, moisture, and gases and in many cases must also be electrically insulated. Thus in general the problem of pipe and its uses in the gas industry resolves itself into a knowledge of the available metals, the various forms in which the metals may be used, the expected deterioration of the metals, the causes and mitigation of the deterioration and economical considerations.

The effects of corrosion are clearly discernable but the assigning of numerical values to represent the degree of deterioration has been particularly difficult. Indirect methods of representing the degree of corrosion have been established and allow for comparative studies within limits. The importance placed upon research as a means of providing fundamental data and knowledge on corrosion is indicated by a United States Bureau of Standards release on corrosion research which states, "the total cost from 1922 to January 1, 1935 will approximate $400,000. Of the total expended for the study, the share of the Bureau of Standards is roughly forty per cent. The remainder of the costs have been borne by nearly 200 public utility organizations, pipe and coating manufacturers and trade associations."

History of Corrosion

The devastation of corrosion has been recognized since the origin of gas transmission and distribution but its control as an economic necessity is comparatively recent. Men of vision in the latter half of the 19th century emphasized the need for protecting sub-surface structures. In an issue of the Iron and Steel Dust Magazine in 1893 is found an article by D. J. Spataro on "Corrosion of Cast Iron Pipe." This article indicates that engineers of that period were fully aware that under certain conditions even cast iron had a definite life limit. Newbigging in his book published in 1913 mentions U and V shaped wooden forms placed around distribution mains and filled with hot pitch and tar. Practices of this nature can be traced back to 1870.

Oil lines laid in Mexico previous to 1900 indicate advanced knowledge of soil action as these lines were not only protected with a bituminous mixture but wrapped with asbestos felt. Experience apparently proved the value of the asbestos wrapper as in 1907 and again in 1913 additional lines were similarly protected in Mexico. In 1915 the Oklahoma Gas and Electric Company duplicated the Mexican practice and in 1921 the methods were repeated on larger scales in Louisiana. In 1921 wrapped lines were also laid in California and Oklahoma and in 1927 in Kansas and Texas. An asbestos felt was used on all of the above

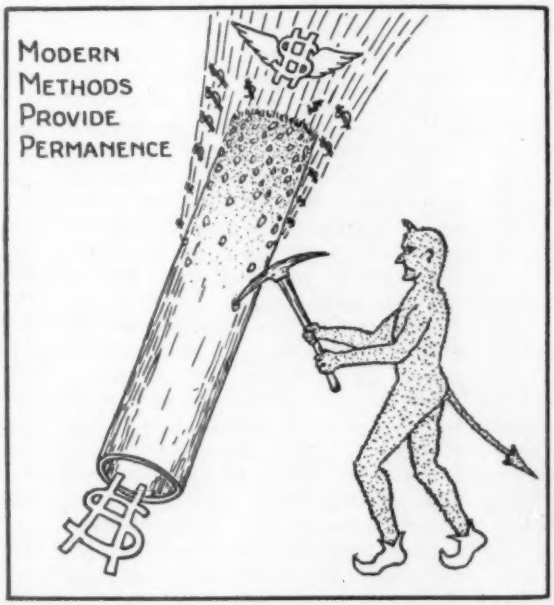
mentioned lines. The success of the wrapped lines led to the development of specially prepared asbestos felts for sub-surface lines.

As the use of wrappers became more extensive the difficulties of hand wrapping in the field resulted in the development of mechanical equipment for field wrapping succeeded by mill wrapping. Previous to 1928 a pipe mill on request of customers coated and wrapped pipe using lathes and other similar available equipment not especially designed for the purpose of pipe wrapper application. In 1928 commercial mill wrapping plants were erected as separate entities in conjunction with pipe mills.

The coatings used during the last century were mostly coal tar pitches secured from an abundant supply available from producers of manufactured gas. Apparently the use of ordinary paints was found to be impractical during the early stages of pipe line corrosion mitigation, as but few references can be found to their use.

Corrosion Research

An American Gas Light Association report mentions removal of specimens buried by the U.G.I. Company 7 years previous. These specimens were coated with a mixture of tar, lime, tallow, rosin, and crude rubber, heated under specified conditions and the pipe immersed in the mixture. These recorded tests indicate that the art of pipe coating had advanced as early as 1896 to a definite recognition that protection was essential in some locations and research was warranted to determine the comparative value of the various types. This research on the comparative values of coatings had as a natural sequence a desire for more intimate knowledge of the causes of corrosion. Attempts were made to counteract the corrosive agents in the soil.



By 1918 corrosion research had determined that counteracting corrosive agents by the use of chemicals such as lime or other soluble hydroxides was ineffective as such protection was only temporary. The World War decidedly curtailed the study of sub-surface corrosion as efforts were concentrated on mass production rather than research to extend life. In 1922 the United States Bureau of Standards commenced a definite study of soil corrosion which marked a milestone in the knowledge of the agents causing corrosion. Since 1922 there has been greater progress in obtaining and disseminating information regarding the causes and means of combating corrosion than in all the previous years.

K. H. Logan in his article "The Use of Bureau of Standards Soil Corrosion Data in the Design and Protection of Pipe Lines," states that early corrosion studies of the Bureau were to determine the metals that withstood corrosion for the longest period but in 1922 the samples buried were to determine the relation of soils to corrosion.

Recent developments in pipe coatings recognize the value of protective methods used in other than gas industries and their advantages have been adapted to pipe line practices.

The most common pipe coating used today is the so-called pipe line enamel. The use of enamels for protection against corrosion apparently originated in England where they were developed as a protection for marine structures as early as 1891 and introduced for the same purpose in the United States in 1896. The use of enamel on sub-surface pipe lines was first attempted in 1910 although it was not until 1913 and 1914 that it advanced to a more practical trial in the coating of 2000 feet of 66″ diameter steel water line in Brooklyn, N. Y. In 1914 enamel was used on oil and gas lines by the Shell Oil Company of California. Between 1914 and 1925 the manufacturer who had introduced enamel protection in America, importing the processes from England, coated a few other test lines but the difficulties of practical application delayed general use. November 1925 is the first recorded use of the sling method of applying enamels and occurred on a 6″ main which was buried in a cinder fill in Coatesville, Penn. The development of coating application on this particular installation included designing containers for carrying the enamel after the bottoms of the original containers fell out due to the solder melting. In the spring of 1926, the Peoples Gas Company of Glassboro, New Jersey, used the sling method of application but added a number of new features and may be credited with contributing materially to the method and establishing a procedure control for pipe line enamel application.

First Rolling Rig

The first recorded uses of a rolling rig for revolving pipe during application of a coating was on a 22″ steel line installed by the Interstate Natural Gas Company from Monroe to Baton Rouge, La., in 1927. In addition to the development of the sling method of application at Glassboro, N. J., in 1927, there simultaneously occurred the initial use of a coal tar base enamel. The enamels previously used had an asphalt base.

The now commonly known inhibitive types of greases were originated in 1916 and first applied on gas lines in 1918. Wrapper impregnated with the inhibitive type of greases was first used on gas lines in 1921. Many researches are in progress seeking effective, economical wrappers some of which will be described later but except for asbestos and kodapak successful development has not been sufficient to make them historically significant.

Cause of Deterioration

A common cause of pipe line deterioration in all locations and possibly one of the most important factors to be contended with in modern city systems is electrolysis. This is so closely allied with corrosion that it is considered part of the subject. European countries early recognized the evils of stray currents as an eco-

(Continued on page 50)

Detroit Adopts New Rate Form

In Connection with Introduction of Natural Gas

THE following notice is being sent to customers of Detroit City Gas Company:

"We are pleased to announce that about the first week of July we shall begin furnishing you with natural gas that will be piped to Detroit from the vast fields of Texas and Southwestern Kansas. Construction crews are rapidly approaching the city, laying the last few miles of what will be the longest natural gas pipeline in the world.

"This pipeline when completed will place annually at the disposal of this great industrial center more than three times the amount of gas fuel ever sold here in any one year. This is equivalent to 1,263,000 tons of coal or 219,000,000 gallons of oil. By the terms of the gas purchase contract, signed August 31, 1935, the cost of gas is specifically controlled and customers of the Detroit City Gas Company are practically assured against rising fuel prices for a period of fifteen years. No man can read the future, but in the past widely fluctuating costs have been disturbing factors, not only to the Gas Company budget but also to the budgets of other industries and residential consumers. For the future this stabilizing factor is particularly important, in view of the present period of rising costs and inflation.

"Our Company has endeavored to secure a contract containing these advantages for nearly five years, during which time it repeatedly rejected proposals because they were not in line with this objective. The cost of gas under this contract is 34% lower than the lowest previous proposal offered.

"While this contract is very valuable to our customers it represents only one of three major progressive steps taken by this Company in the interest of good service. By agreement with the Mayor and Common Council of the City of Detroit, we have entered upon what has become nationally known as the 'Detroit Plan', which limits the Gas Company to an annual base earning, deemed sufficient to insure sound financial operation. It also provides that the greater amount of the Company's earnings in excess of this figure is to be returned to our domestic customers in the form of annual cash dividends. Having entered into this agreement the Company is determined that distribution of such cash dividends shall be realized at the earliest possible date. To this end we will, for the first year of natural gas service, voluntarily waive our participation in any excess earnings.

"On or about July 7, when natural gas reaches our River Rouge plant, we will begin to change the Metropolitan Area, section by section, from the use of manufactured gas to straight natural gas. This is the largest engineering task of its kind ever undertaken. It will require about four months to complete. Some of our customers will begin receiving natural gas in July, while others will receive the new service in August, September or October. All domestic consumers' appliances, comprising some three million burners, must be adjusted twice. Every effort will be made to effect the change-over with the least possible inconvenience to customers and at the same time to maintain satisfactory service. The cost, defrayed by the Company, will exceed two million dollars.

"In addition to bringing natural gas to Detroit and our customers into a profit-sharing partnership, we have also established promotional rates—a third major progressive step. As in all businesses, large sales permit low prices which, in turn, stimulate large sales. Mass production and quantity sales have lifted Detroit to national industrial leadership. The application of this basic principle conforms to the spirit and intent of the 'Detroit Plan', and by its adoption the full effect and advantages of natural gas can be reflected in maximum rate reductions.

"We have been furnishing you a given amount of heat for a stated price. The price has changed from time to time,—the amount of heat has not. For many years the unit in Detroit has been 530,000 British thermal units (or 1,000 cubic feet by volume). Such a 'package' of heat will, for example, boil 300 gallons of water or melt 125 pounds of pig iron. For simplicity in comparison, we will still continue to sell you a unit or 'package' of heat containing 530,000 heat units, which we will designate as a 'Detroit Gas Unit'.

"The following promotional rate schedule will become effective when natural gas is available to the consumer's premises:

"For all uses except house heating:

First 2 Detroit Gas Units
Per Mo. .....75c per unit
All Over .....55c per unit
For House Heating ...32c per unit

"The House Heating rate, applicable to gas metered separately for space heating, is available to each customer who uses no other kind of fuel than gas for heating his premises.

"The minimum monthly bill will be 86c. Bills not paid on or before the last net payment date stated on the bill will be subject to a delayed payment charge of 10c per Detroit Gas Unit. These Promotional rates represent such drastic reductions it is necessary that we adopt a Minimum Payment Plan to provide sufficient revenues during the development period. It is our intention to abolish this provision as soon as revenues, built up by promotional rates, justify such action. The Minimum Payment Plan is as follows:

"The amount of the Minimum Payment for natural gas service during the temporary development period will be the same as the customer's bill for the corresponding month of the year immediately preceding natural gas service. Each customer will be entitled to all the gas this amount of money would purchase at the promotional rate without any additional charge.

"For example, assuming that our average customer now uses 3.31 Detroit Gas Units per month and pays $2.75; under our Minimum Payment Plan this customer while continuing to pay $2.75 per month will be entitled to 29% more gas without extra charge. All gas used in excess of this additional amount will be billed at the Promotional Rate of 55c per D.G.U., which is 33.7% less than our present rate. All gas for house heating will be sold at the flat rate of 32c per D.G.U., which is 42% below the present house heating rate.

Furthermore, this customer, as a domestic consumer, under the Detroit Plan will receive annual cash dividends.

In the event that any customer should use less gas in any one month than would amount to the minimum payment at the promotional rate, such customer's monthly bill will be computed at 83c per Detroit Gas Unit, but in no case more than the minimum payment or less than 86c.

For customers not heretofore served by this Company, gas for other than house heating shall be billed at 83c per Detroit Gas Unit until twelve monthly bills have been rendered, in order to establish the minimum payment required under the operation of the Promotional Rate. Gas used for house heating by all such customers will be billed at the flat promotional rate of 32c per Detroit Gas Unit.

Rates for large volume consumption, such as for industrial use, are being offered which we expect will produce material increases in the use of our fuel by automobile and other manufacturers.

Under the 'Detroit Plan' you are our partners. You have an interest in our business success, a share in our earnings and you may be assured that we shall endeavor so to manage the business that our customers will receive cash dividends each year."

A Profit-Sharing Gas Rate

By J. L. Underhill

North Attleboro Gas Company,
North Attleboro, Massachusetts

I HAVE been asked to talk to you on the subject of "A Profit-Sharing or Cooperative Plan Rate" and shall endeavor to tell you what we have accomplished in several of our properties with a rate built along this general plan. I shall deal principally with the results obtained, rather than with the structure of the rate itself, which has already been explained in detail in the April issue of the *American Gas Journal* and also in that excellent report of Special Gas Rates just released by the American Gas Association, and prepared by Mr. Alfred I. Phillips, Chairman of the Rate Structure Committee. Electric competition was the stimulus which hastened development of our "Cooperative Plan A." Several months of study were required to adapt a rate schedule to our requirements and when sufficient data were available, we developed a profit-sharing rate having superior advantages, from a competitive standpoint. Substantially, it is based on the theory that "A half loaf is better than no bread," and recognizes the principle that a customer once lost to an electric competitor is difficult to regain.

The preamble to the rate which has proven exceptionally successful, is as follows:

> "This rate is promulgated in order that domestic and household consumers of the Company may avail themselves of modern gas appliances on a 'pay as used' basis, payment for such appliances to be rendered as a part of this rate."

To continue:

"A domestic or household consumer contracting to use this rate may purchase gas burning equipment to the maximum sales price of $250.00 on the following basis:

> "One half of the monthly gas bill calculated in accordance with this rate shall be allowed as payment towards equipment so purchased. The other half of the monthly gas bill will be accepted in payment of the monthly gas service rendered under this rate."

That, briefly, is the essence of our "Cooperative Plan A" which bears the approval of both the Massachusetts Department of Public Utilities and the Public Service Commission of the State of Vermont. The real value of this, and of any promotional rate, lies in its ready consumer acceptance without which it has little practical value. Our rate, has been outstandingly successful in the properties where it has been used. Not only in the manner in which it rejuvenated interest in our product, even in the face of strong electric competition, but also in its ability to improve public relations, which after all is one of the most important phases in the operation of a utility company.

"Cooperative Plan A" has met with particular success in Ware, Massachusetts, and in Springfield, Vermont, where it has been in operation for the past several months. In Ware, merchandise sales for the first five months of this year were 273% ahead of those for the same period in 1935 and 75% over the entire merchandise sales of last year. More paradoxical is the fact that during May this year, merchandise sales in Ware exceeded gas sales by 10%. In that month alone sales were in excess of $3.00 per installed meter.

For the first five months of this year, Springfield, Vermont, showed merchandise sales equal to those for the whole of 1935 while in both properties 1935 sales were well above those of any year for which we have records. A perfectly obvious retort to that statement is "Fine, but how could you help it." However, not all of our sales, by any means, were made on the profit-sharing rate nor in the beginning did the set-up of this rate anticipate such a condition. Fully fifty per cent of our sales are being made on rates other than "Cooperative Plan A." However, the profit-sharing idea has a direct appeal and brings customers to the sales floor and adds weight to the salesmen's presentation.

We lean too much toward the practice of evolving complicated rate structures, and take pride in the fact that such methods are scientific. The public, however, has of late been slow to grasp the intent of scientifically designed rates and has developed a distrust of this phase of the utility industry through our inability to make it intelligible. I do not believe there is anything, particularly scientific about the average promotional rate and for that reason, it is the nearest we have yet come to a genuine solution of the rate problem.

As a means of creating greater confidence in the public mind, let us as an industry give increasing attention to the rate forms most acceptable to our customers, not forgetting that simplicity and directness must be retained at all cost if we are to succeed in the work we have undertaken.

Presented before the New England Gas Assn. Summer Sales Conference, Swampscott, Mass., June 18-19, 1936.

AS THE EDITOR SEES IT

Pipe Corrosion

ALMOST every gas company is faced at one time or another with a problem involving the corrosion or protection from corrosion of a pipe line. At almost every convention of technical gas men this subject is discussed. Research work running into hundreds of thousands of dollars has been done in an effort to find the answer. Much has been learned and presented in learned discussions, which have passed over the heads of most ordinary mortals. So when we come face to face with a corrosion problem many of us make a stab at its solution, put on a little extra coating and trust to Mother Nature, who is apt to be rather hard on those who act on hunches.

In a recent rather lengthy discussion of this subject an authority finally remarked that the coating of pipe, of course, was nothing but water proofing. How few appreciate fully that one fundamental principle. Nor do many of us realize that a poorly applied coating or one that has been rubbed off in places is probably worse than no coating at all.

Many soils are not seriously corrosive and pipe laid in them may last so long that it would be difficult to justify an expensive material or a protective coating. On the other hand other soils may attack certain kinds of pipe and cause rapid deterioration. Most of us know that an ash fill or a salt marsh is highly corrosive and that dry sand is not. Regarding other soils the average gas man has little knowledge.

Most of our readers have little direct interest in buried specimens or in the results of theoretical research. What they need is simple practical information on the corrosiveness of soils, on when and how to coat pipe, and on ways to secure the maximum life of pipe for a minimum of expense.

We talked to Mr. Eric Larsen about this problem. Mr. Larsen is a past Chairman of the A. G. A. Distribution Committee and one of the foremost authorities on gas distribution in the country. He needs no introduction to our readers who will remember well his articles in the *Journal* on high pressure distribution and on regulator structures.

Mr. Larsen has agreed to write a series of articles for us on the subject of pipe coating and corrosion, bringing to the average man in a simple understandable way the results of the expensive and elaborate scientific research on these subjects. These will be articles for the manager, the engineer and the man in the field rather than the theorist. They are needed and we feel sure our readers will welcome them.

The Exhibition

The Association of Gas Appliance and Equipment Manufacturers will be one year old next October. At that time, in connection with the A. G. A. Convention, it will hold its first exhibit of equipment and appliances.

Since its organization its new association has been going about its business quietly and has been doing its work well. The time for its first large public appearance is approaching. It is determined and each of its members is determined to make this the best exhibit ever held. No effort will be spared to make it so.

It is not too early to make plans now to attend the Convention and the Exhibit and to give this new Association the encouragement and support it so justly deserves.

The Detroit Gas Rates

In the February 1936 issue of the *Journal* we reported the establishment of a sliding scale system of rate regulation in Detroit. Elsewhere in this issue we report the adoption of therm rates and of an objective rate plan.

In the past we have had a few sliding scale gas rates in this country; we have had a number of objective rates, and we have had a few therm rates of the objective type. In Detroit we now have all three of these combined for the first time. What is more a new thermal unit is adopted. The conservative rate man who cannot yet reconcile himself to the objective rate may well despair of the future and wonder what innovation may next make its appearance.

A recital of events in Detroit will of itself be a sufficient comment.

In the latter part of 1934 the Detroit City Gas Company announced that an increase in gas rates was to become effective the following April. The City of Detroit tried to enjoin the establishment of the rates; but they went into effect, and a legal battle ensued. The possibility of securing a supply of natural gas thereafter became apparent. The adoption of a sliding scale plan of regulation was suggested as a means of settling the controversy. The plan proved to be mutually acceptable, and the city dropped the rate case.

Next came the problem of protecting revenues and building up sales when natural gas is introduced. The therm rate is intended to do the former, the objective rate the latter.

The new thermal unit, called the "Detroit Gas Unit" has been adopted. It is 530,000 B.t.u., and is equivalent to 1,000 cubic feet of gas of the heating value heretofore manufactured. With the introduction of natural gas the "Detroit Gas Units" will merely come in more concentrated form. The "immediate" rate per "Detroit Gas Unit" will be the same as at present; but a new and lower "objective" rate is established and is applied in accordance with the principles described in many previous issues of the *Journal*.

If this plan yields a revenue greater than contemplated under the sliding scale, then the customers will become entitled to a dividend. In all respects both the company and its customers appear to be protected.

The City of Detroit and the Detroit City Gas Company deserve to be congratulated on having worked out a difficult situation with such apparent fairness to all concerned.

Should "Mass Production" Methods Be Used in the Office?

By

H. J. Johnson

Manager, Public Utility Sales Division
Remington Rand, Inc., Buffalo, N. Y.

DURING the "high speed" and "mass production" period of the past ten years, almost every type of activity was placed on a highly specialized basis. This trend started in factory methods but was soon extended to include office procedure.

It is an admitted fact that specialization has certain advantages but these have been permitted to completely overshadow a number of disadvantages. One contention has been that it is easier to train inexperienced clerks on a specialized operation due to the fact that there is only one thing for them to learn. It has also been believed that both the quantity and quality of the work would be improved because a clerk could concentrate on a specific activity.

It is undoubtedly true that the preliminary education is somewhat simplified but the opportunity for a complete training in all related activities is almost completely lost. Clerks are sometimes transferred from one assignment to another in order to secure a broader education but it is impossible for any clerk to cover all jobs. Even if it were possible to do so very few clerks would be able to visualize the relationship of the various activities. This is due to the fact that each individual job is handled on a completely detached and unrelated basis. This specialized method of procedure is very largely responsible for the definite lack of properly trained and qualified individuals for promotion to positions of greater responsibility.

Contrary to the expectation that the quality of work would improve and that clerical cost would be reduced, the quality has actually depreciated and costs have increased. The reason for this is easily traced to the fact that the sameness of the work makes it monotonous. Monotony always destroys interest and pride of accomplishment—without these two elements to act as an incentive both quality and quantity of work will suffer. For the purpose of this discussion we will consider the problem of customer bookkeeping because it is in this department that specialization has been most highly developed. In this department there is another very important element to consider and that is customer service. The recent trend has been very definitely in the direction of less specialization. This is evidenced by the fact that some of the larger companies have attempted to create group units with specialists performing the duties within each group. The net result of this has been that from the standpoint of the customers bookkeeping work a large company has simply been divided into several small ones because each group is so organized that it functions entirely independent of any other group.

One reason for setting up an organization of this type is that the handling of a large department on a completely specialized basis becomes very unwieldy.

The plan of customers accounting that has proved to be the most satisfactory and most efficient from the standpoint of improving service to the customer, reducing clerical expense and getting a better quality of work, has been what is usually referred to as "the unit plan of bookkeeping."

Under this plan each bookkeeper is provided with an insulated desk equipped for housing the meter books, service ledgers, merchandise ledgers as well as the necessary transferred records for a unit of approximately 10,000 accounts. Each day's work is divided among all the bookkeepers so as to avoid any peak period. Under this plan of operation a bookkeeper performs all of the following operations.

1. Post service orders in the meter books.
2. Make all postings to the gas accounts.
3. Balance unpaid gas accounts.
4. Make all postings to merchandise accounts.
5. Balance merchandise accounts.
6. Check delinquent notices.
7. Prepare arrears for machine operators.
8. Furnish information in connection with duplicate bill requests.
9. Furnish information in connection with high bill complaints.
10. Furnish the necessary information in connection with any inquiries regarding the account.
11. Set up penalties or forfeited discount.
12. Handle all final bill accounting.

On the specialized plan of operation the clerks required for performing all of the foregoing operations results in an average of from 2500 to 4000 accounts per clerk. The problem of supervision on a specialized plan is much more difficult. The unit plan of bookkeeping has, from actual experience, been found to have the following advantages:

1. Establishes complete responsibility for both accuracy and amount of work required.
2. No clerk will ever have any records that may be needed by any other clerk.
3. Will completely eliminate all interruptions.
4. Will eliminate all opportunity for visiting and gossiping.
5. Provides a uniform basis for accurate comparison of both quantity and quality of work performed by each clerk. This is impossible on the specialized basis of operation because no standard of comparison can be established.
6. Speeds up service to the customers in connection with duplicate bill requests, high bill complaints and general inquiries regarding the account.
7. Will effect a large reduction in clerical operating expense.
8. Provides an opportunity for training the Bookkeeping Department personnel in all related activities.
9. Will provide greater flexibility in transfer of the personnel to handle any relief or vacation requirements.
10. Will provide a basis for establishing proper compensation schedule on basis of efficiency, amount of work performed, quality of work and number of accounts handled.

The use of an insulated desk for housing the various records has the following advantages:

1. Provides protection of all customer records at point of use.

2. Provides fire protection of customer records twenty-four hours a day.

3. Saves bookkeepers time by eliminating necessity of transporting records from safes or vaults to the point of use.

4. Saves the floor space normally required for safes or vaults in addition to the floor space required by the greater number of clerks.

5. Places all records within reach of bookkeepers without the necessity of the bookkeeper leaving his regular place of operation.

6. Will simplify both organization and supervision of the work in the department.

7. Makes it possible to concentrate all related records for a specialized group of accounts in one place.

Each bookkeeper is provided with a telephone instrument of the intercommunicating type. Each customer contact clerk is also provided with the necessary telephone facilities and a directory which shows the exact division of accounts. The directory is set up alphabetically by streets with each street divided according to meter reading routes. Opposite each meter reading route is shown the number of the bookkeeper handling that route. Whenever a duplicate bill request is received the customer contact clerk fills in the customer's name and address on the proper form together with the route number as shown by the directory, then calls the proper bookkeeper who supplies the account number and amount. This requires considerably less than one minute.

High bill complaints are handled in exactly the same way except that the customer's name and address is entered on a high bill complaint form and the bookkeeper instead of referring to the ledger record selects the proper meter reading book and gives the consumption for the required number of months. This can be handled in not more than two minutes.

Each customer contact clerk dials directly to the proper bookkeeper whether the call is being made from within the same building or from a branch office. This procedure saves a great deal of reference time, eliminates the necessity of the bookkeeper being interrupted by another clerk, saves the time required for serving the customer and provides very much improved service to the customer.

Requirements Committees Act to Hasten Developments of Hair Dryer Standards

ALTHOUGH it was the feeling of the A.S.A. Sectional Committee, Project Z21, A.G.A. Approval Requirements Committee, when it reviewed proposed approval Requirements for Gas Hair Dryers at its April 23-24 meeting, that the new hair dryer standards should be modified and extended to some extent before adoption, it was recognized that all haste possible should be made in providing accepted national standards for this new type of gas appliance and in offering to hair dryer manufacturers appropriate A.G.A. Laboratories testing and certification service. Accordingly, the Sectional Committee, after returning the proposed hair dryer requirements to the subcommittee for revision of certain clauses, made a special ruling that, if the tentative Approval Requirements for Gas Hair Dryers can be suitably revised by the subcommittee and approved by the Sectional Committee before January 1, 1937, they shall become effective as of that date. A meeting of the subcommittee has been tentatively set for June 25 and 26 and it is hoped that all necessary committee action relative to the standards can be completed so that hair dryers may be tested for approval on and after September 1st, although the requirements would not become officially effective until January 1, 1937.

The consensus of the Sectional Committee, in returning the proposed hair dryer standards to the subcommittee for further consideration, was that some provision should be made for the approval of manually operated gas hair dryers and that flue collars, to which standard flue pipe might be attached, were possibly unnecessary on small units (often portable) rated below approximately 5,000 B.t.u. per hour.

In regard to those hair dryers which, during the last two years, and for lack of appropriate standards, have been approved by the American Gas Association Testing Laboratories under the requirements for space heaters, unit heaters, and central heating gas appliances, the Sectional Committee accepted the subcommittee's recommendations, to wit:

1. Hair dryers already approved under other appliance standards cannot be listed as hair dryers in the Association's Directory of Approved Gas Appliances and Listed Accessories unless such appliances are re-submitted for test and approved under the Approval Requirements for Gas Hair Dryers.
2. Hair dryers which have been tested and approved under the requirements for space heaters, unit heaters, or other standards, may continue to be approved and listed as such for a maximum period of five years from the date of original approval, but must be retested and approved under the hair dryer standards at the end of that period if approval is to be extended.
3. This committee strongly recommends that all hair dryers now approved under other appliance standards and listed accordingly be re-submitted for compliance with the Approval Requirements for Gas Hair Dryers as soon as such requirements are available.

It was also ruled that no additional hair dryer models be accepted by the Laboratories for test and certification, until specific Approval Requirements for Gas Hair Dryers have been completely developed and accepted by the A.S.A. Sectional Committee, Project Z21, A.G.A. Approval Requirements Committee. This, it is expected, will occur on or about September 1, 1936.

New Gas Rate

The Northern States Power Company, Minneapolis, Minn., is installing a new gas rate for automatic hot water heating in Grand Forks, N. D., Fargo, N. D., East Grand Forks, Minn., Moorhead, Minn., Brainerd, Minn., Stillwater, Minn., Bayport, Minn., and Oak Park, Minn. The new rate carries a commodity charge of 10c a hundred and has a net minimum bill of $1.50 a month. This new automatic water heating rate is available to all domestic, commercial, and industrial customers who will sign for same on an annual basis.

A special automatic water heating sales campaign will be started in the above-mentioned communities not later than July 15.

Ford's Forging Furnaces

By

J. B. Nealey

American Gas Association

THE Metallurgy of forging has been so developed and improved that today it can be included in the list of exact sciences. The use of the refined fuel gas in modern furnaces has contributed much to this advancement. These furnaces are clean, compact and insulated against heat losses and the radiation of heat into the surrounding atmosphere. They are the least expensive to operate including labor, upkeep and fuel, and, as in heat treating, they continuously and exactly reproduce a uniform product of the best quality.

Between 600 and 700 furnaces, fired with gas fuel, are used in the Ford Motor Company's gigantic plant. Gas is employed in this plant starting with the open hearth steel furnaces where the steel is made and the soaking pits, where the steel billets are reheated for the rolling mills and ending with the heat treating of the finished parts and the drying of the paint on the finished cars.

The Steel Building is shaped like an I with the ten open hearth steel furnaces and 60 soaking pits located along the top cross bar, the rolling mills along the body of the I and the forging furnaces and hammers in the lower cross bar. Thus the steel comes in a continuous stream, directly from the furnaces, through the different stands of rolls, to the forging division where it is formed hot into various parts for the Ford car.

There are three long and parallel rows of forging furnaces with approximately 15 box type furnaces in each, and a fourth consisting of long continuous furnaces. The hammers set in between the furnaces leaving a broad aisle between each row for the movement of operators and material. Each row is served with a continuous traveling conveyor which is located just back of the hammers and runs under the furnaces, and onto this the hammer men throw the finished forgings. These are discharged onto a grid where they are sorted and routed to the various machine shops for finishing. There are also overhead monorail conveyors with baskets for small parts.

Reprinted from "Metals and Alloys."

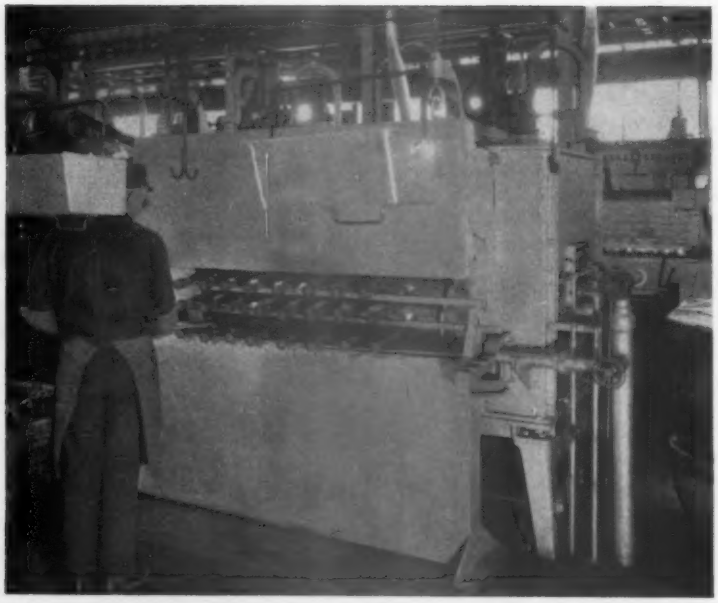
Most of these furnaces are of the slot type, ranging around 10 x 4 x 3 feet high and set in 2 ft. legs. They are of brick, steel encased and each is heated with a single gas burner equipped with a gas-air proportioner of the inspirator type. A casting projects about 2 ft. beyond the furnace at each end of the slot, and a refractory wall, rises from the floor to the bottom of the slot, just beyond these. The castings and the wall are used to rest the material being heated and the wall also serves to protect the operator from the heat. A heavy cast iron shield is suspended about 6 in. in front of the furnace and extends from the top down to the upper edge of the slot, and a 2 in. drilled pipe, located under the lower edge of the slot, is used to blow the hot air from the furnace up and back of this shield.

A modification of this type is one in which the front is left open and then filled with refractory blocks so spaced as to leave three rows of ten holes each. These are used to heat one end of cam shaft forgings which is then formed in an upsetter. The floor wall and suspended shield with air curtain are also provided for these furnaces. There are several other similar furnaces, built to heat less stock, that are used for other parts.

Diffusion flame burners have been placed on two or three of these slot type forging furnaces.

The burner is located in one end and the diffusion flame travels the length of the furnace parallel with the slot. On one of these furnaces the burner proper consists of a series of small tubes protruding through an air box into a combustion throat that opens directly into the furnace. The plate of the air box through which the gas tubes protrude into the combustion throat is perforated with

Continuous gas furnace with motor driven chain loop spindles. The spindles protrude through the hearth and form a conveyor which carries the work through. Note overhead continuous conveyor with baskets for transfer of work.



Slot type gas fired forge furnace in which slot is covered by a refractory block wall with 3 rows of holes for the stock. This naturally increases the capacity of the furnace and reduces the escape of heat.

multiple ports through which air is forced. This provides multiple and parallel streams of gas and air which burn with a luminous flame. At the hearth line is a series of tubes through which gas alone is forced into the furnace and this raw gas blanket envelopes the steel being heated and protects it from scaling. Hot products of combustion are drawn out at the opposite end of the furnace and passed through a recuperator to preheat the air that is used in the burner.

Diffusion combustion is a controlled luminous flame resulting in a definite and adjustable flame length with a uniform temperature throughout. This process requires alternate layers of gas and air moving in laminar flow with no turbulent action as in luminous flame combustion. The gas and air are mixed by diffusion which follows natural lines so that the rate of mixing is definite and uniform and can be determined for given conditions. Correct proportions of gas and air with complete combustion are possible. Under the conditions of gas and air flow required for diffusion combustion it is possible to have a layer of gas on the bottom of the flame which will completely blanket the work and protect it from contact with the air above. The important distinction between diffusion combustion and luminous flame combustion lies in the difference in laminar flow and turbulent mixing and in their effects on the characters of combustion.

A feature of the forging furnaces in this plant is the use of a dolomite bed to protect the hearths. Prior to this the hearth brick disintegrated so fast that they had to be replaced at the end of each shift. Now from 2 to 2½ in. of powdered dolomite is laid on the hearths and so protects them from slag and heat that they stand up from three to eight months. The dolomite absorbs the slag and is usually changed every two weeks. The steel can be placed directly on the dolomite bed while being heated as the dolomite is perfectly dry and does not adhere.

Steel is forged on an initial heat approximately 2100 deg. with an allowable range of 100 deg. on either side. When several forging operations are involved the temperature drops rapidly and some jobs are reheated. The lowest temperature limit allowed is about 1650 deg. F.

A number of continuous forging furnaces of the chain and sprocket type are included in the equipment of this division. One of these, which is employed in heating stock for the radius foot is 15 ft. long, 4 ft. wide, and 4 ft. high and sets on 3 ft. legs. It is provided with a motor driven loop chain conveyor, which operates below the hearth. Spindles 18 in. long bolted to the chain on 6 in. centers, protrude through a slot in the hearth and the work is carried through the furnace on these. This method eliminates the heating of the chain and thereby prolongs its life. Heat is supplied to the furnace through four gas burners on each side, located in the front half (discharge) and the conveyor extends 4 ft. beyond the charging end for loading. Another operator removes the hot stock from the discharge end with tongs and places it directly in the press. Two similar furnaces parallel and built so as to form a single unit have a chain conveyor running through the space between. Front axles are so carried on the conveyor that each end protrudes into a combustion chamber and is then heated for forming.

An automatic control is also a part of the equipment of this furnace and with this the temperature is mechanically maintained at any desired degree. Most of the burners in these furnaces are supplied with proportional mixers (gas and air) of the venturi type, gas being furnished at 15 lbs. pressure and the inspirator is set to draw in whatever volume of air is desired. With this device any desired furnace atmosphere, reducing, neutral or oxidizing, can be obtained and from then on is automatically maintained regardless of the volume of work passing through or the amount of fuel being burned. The temperature controller consists mainly of a thermocouple in the furnace and motor operated valve in the gas supply line. When the temperature rises above the point set on the indicator the motor of the valve is energized and closes off the fuel supply to the burners and conversely when it drops below this point, it operates to reopen the valve.

Similar furnaces used for normalizing these forgings ranging up to 20 ft. in length, and similarly controlled are located nearby. For cam shafts one of these furnaces is equipped with 4 chain loops and plates are bolted onto the tops of the spindles. In this manner two rows of cam shafts pass through continuously. The other furnaces are used interchangeably for different types of work.

Normalizing furnaces of the pusher type range up to 25 ft. in length, are 6 ft. square in cross section, and are heated with 4 gas burners on each side, over-firing the work. The forged parts are carried through in alloy trays riding on water cooled skids (pipe) which protrude 7 ft. beyond the charging end for a loading table. An overhead rail with chain hoist, runs along one side of the furnace and is used to return the trays to the loading table. The pusher is operated with a motor, cam and link device and the heating period is regulated by adjusting the frequency and length of stroke.

Another forging division is located in the Spring & Upset Building and here heavy die blocks and other

parts requiring crane handling are heated and formed under giant hammers or presses running up to 2,000 tons capacity. A battery of car type furnaces is employed in the heating of large billets, the cars being run out on tracks and the billets loaded onto them by crane. These furnaces are all of brick construction, heavily insulated and encased in steel. Each is approximately 16 ft. long, 12 ft. wide and 8 ft. high and is heated with three gas burners on each side or six in all. The front is closed with a counter weighted door and the car is operated on the track with a motor operated rack and pinion located between the rails. The car top is of firebrick to form the hearth and is sand sealed with the walls so that no heat can penetrate through to the trucks and wheels below. Waste products of combustion are exhausted to a stack through ducts and an induced draft from a motorized fan.

Loaded and unloaded with a heavy mechanical billet handler are two billet furnaces of the same size and construction as those described except that no cars are used, the hearths being stationary. These are so set as to form the two sides of a square and the track for the billet handler is laid past one end up to the door of the other. This billet handler is motor operated both as to its movement on the track and the head holding the billet. This head can be moved about an horizontal circle, up and down and into and out of the furnaces. After heating it transfers the hot billet to a thousand ton steam hydraulic press.

Close by is a battery of from 15 to 20 slot type forge furnaces for heating smaller stock. These are of brick and steel, each being about 6 ft. deep, 6 ft. high and 10 ft. wide, the slot running the length of the long side. Heat is supplied with a gas burner in each end overfiring the work, and each equipped with a counter weighted door. A steel apron is provided in front as an aid in placing the stock to be heated.

A combination of two types, slot and continuous, is used for heating one end of cam shaft stock that is to be upset in an Ajax header, which is directly adjacent. This furnace is 9 ft. wide, 4 ft. deep and 5 ft. high, and has a slot running the entire length of the long side. Heat is furnished through a gas burner located in each end. Directly in front of the furnace and slot is an endless loop chain conveyor, motor operated, and at an elevation that will permit the ends of the steel placed on it to protrude into the furnace, through the slot, as it rides along on the chain. An operator with tongs continuously transfers the hot stock to the header where the end is upset.

Some of these parts are then normalized in continuous, pusher type furnaces which are about 14 ft. long, 7 ft. wide and 5 ft. high. These have alloy rails on the hearth for the work to ride on and the parts are pushed through by a pusher head operated by motor through a cam and link mechanism. The hearth extends 4 ft. beyond the charging end for loading purposes and three rows of forgings are pushed through at the same time. Temperatures close to 1650 deg. F., depending upon the class of work, are maintained with four gas burners on each side. The heating period is regulated through the length and frequency of the pusher stroke.

For a time there were a number of forge furnaces in which this heat was derived from electric elements, but practically all of these have been converted to gas.

Review of Principles of Heat Transfer

Prof. C. C. Furnas
Yale University, New Haven, Conn.

THERE are 3 mechanisms involved in the field of heat transfer: radiation, conduction and convection. The three methods are well illustrated by a boiler furnace. Rays of radiant heat leave the surface of the glowing fuel bed and travel with the speed of light to the tube surfaces. There the radiation is absorbed by the surface, thus raising the temperature. As soon as the outer surface temperature is raised the molecular vibration of the molecules of the tube surface are communicated or conducted to the colder (water) side of the tube, that is, the vibrational energy or heat is passed through the solid substance but the molecules themselves stay in a fixed position. If there is any scale in the tube the heat is sent through this scale by conduction. Heat is also conducted through a minute film of water molecules which stay fixed to the tube surface. Only after the heat energy has passed through all these resistances, does it succeed in transferring from the surface of the glowing coals to the body of the water in the tubes. After the body of the water in the tube receives the heat it is carried or convected away, by the moving fluid either as steam or as hot weater.

Abstract of Paper presented before the A.G.A. Production and Chemical Conference New York, N. Y., May 25th.

Heat Transfer by Radiation

The amount of heat transferred by radiation may be approximately expressed by the equation,

$$\frac{Q}{\theta} = A\, p_1\, p_2\, 0.162 \left\{ \left[\frac{T_1 °F}{100} \right]^4 - \left[\frac{T_2 °F}{100} \right]^4 \right\}$$

$\frac{Q}{\theta}$ is the B.T.U. per hour transferred.

A is the area of the receiving body.
T_1 is the temperature in Fahr. absolute of the hot body.
T_2 is the temperature in Fahr. absolute of the cold body.
p_1 is the black body coefficient of the hotter body.
p_2 is the black body coefficient of the colder body.

This is only an approximate equation. The true equation depends upon shape and relative position of the two bodies, but the above is sufficiently accurate for most purposes provided the colder body can "see" the hot body from nearly all angles.

Average values of p for a few substances are as follows:

lamp black	0.95
oxidized iron	0.75
fire brick	0.85
oxidized copper	0.50
coke	0.7-0.8
silver	0.02

Heat Transfer by Conduction

As ordinarily handled, heat transfer by conduction is considered as exactly analogous to conduction of electricity. Instead of a potential difference there is a difference in temperature or temperature gradient through a piece of solid matter, or a quiescent layer of liquid or gas.

As long as the particles of the system are themselves staying in a fixed position the heat passes through the system by conduction. The equation generally used for conduction is,

$$\frac{Q}{\theta} = K\,A\,\frac{\Delta T}{L}$$

This equation applies to *linear* conduction, i.e., conduction through a slab of homogeneous material, brick for instance.

$\frac{Q}{\theta}$ = B.T.U. transferred per hour.

A = area of the cross-section of the path.

ΔT = temperature difference on the two sides of the wall.

L = length of path of heat travel (thickness of wall), $\frac{\Delta T}{L}$ can be expressed as temperature drop per unit of length.

K = the coefficient of thermal conductivity, is expressed as B.T.U. per hour per square foot cross sectional area per degree F. temperature drop per foot of length of path. Its value is a characteristic of the substance and depends somewhat on temperature. It is customary to use the average value for the temperature range involved.

Values of the coefficient K vary from about 225 B.T.U./hr./sq. ft./degree/ft. for copper to about 0.013 for air. Fire brick have values of K ranging from 0.6 to 0.8. The value of K for water is about 0.3 and for hydrocarbon oils about 0.08. Hence it is seen that a *quiescent* layer of water or oil is a better insulator than fire brick.

Transfer by Convection

Most of the convection systems of importance involve the transfer of heat from one fluid to another through some sort of a wall, usually metal. The term "convection" in such a case is rather a misnomer for the transfer is largely determined by the conduction through various materials. However "convection" is the term universally applied to such cases, for there is a fluid flowing through the system, so we will not attempt to change it.

Consider a hot oil inside the tubes of a shell-and-tube type of exchanger being cooled by water outside the tubes. Heat is transferred from the body of the oil in a tube by conduction through a very thin stagnant film of oil which clings to the tube. In most practical cases there is a layer of dirt or scale between this film and the tube wall. The heat has to be conducted through that. Following that the heat has to be conducted through the metal of the pipe wall, then through the layer of dirt or scale next the other side of the wall, then through the thin adhering layer of water. The B.t.u.'s thus finally arrive in the water stream and are carried away.

The value of a film resistance depends upon a variety of things, namely, (1) the dimensions of the conduit, (2) the speed with which the fluid is moving in the conduit, (3) the density, (4) the viscosity, (5) the specific heat and (6) the thermal conductivity of the fluid. It is not at all surprising that a great deal of confusion and complexity has arisen in attempting to correlate one variable with 6 others.

The most reliable correlation to date of these various factors has resulted in the following semi-empirical equation which is theoretically sound and reasonably accurate.

$$h_{f11m} = 0.023\,\frac{G^{0.8}\,C_p^{0.4}\,K^{0.6}}{D^{0.2}\,z^{0.4}}$$

This equation has the advantage of being dimensionally homogeneous, that is, it is valid for any set of units, metric or English, *provided* the units used are consistent throughout. The density of the fluid apparently is left out of the correlation but it is contained in the term G, which refers to the mass rate of flow.

For the English system, the units which must be used are:

h_{f11m} = B.t.u. transferred per hour per square foot per degree F. difference between body of the fluid and the temperature of the wall.

G = mass rate of flow = lb. per hour per square foot of cross section of conduit.

C_p = heat capacity = B.t.u. per lb. per deg. F.

K = thermal conductivity of the quiescent liquid = B.t.u. per hour per square foot per degree per foot of length of path.

D = diameter of conduit in feet.

z = viscosity in English units (lb. per hour per foot). If the value of viscosity is known in centipoises it must be multiplied by the factor 2.42.

These various physical quantities in this equation are to be evaluated for the average temperature of the main stream of the fluid. The physical properties can be obtained from any of several published tables.

The equation represents a correlation of data for air, carbon dioxide, coal gas, steam, water, acetone, benzene, kerosene, butyl alcohol and oil. It may be applied with considerable confidence to other fluids for which the physical properties are known.

This equation is applicable only for fluids that are in "turbulent" flow, that is if they are moving rapidly enough so that the fluid is well mixed throughout the tube and is not moving in layers. The fluid will be in turbulent motion if it is moving at a velocity such that the value of the ratio $\frac{D\,G}{z}$ (units given above) is greater than 2300. In most systems of industrial interest the fluids are in turbulent motion so the case of laminar flow will not be discussed.

For water at 100° F. equation becomes,

$$h_{f11m} = 0.01\,\frac{G^{0.8}}{D^{0.2}}$$

For air at 100°F. equation becomes,

$$h_{f11m} = 0.047\,\frac{G^{0.8}}{D^{0.2}}$$

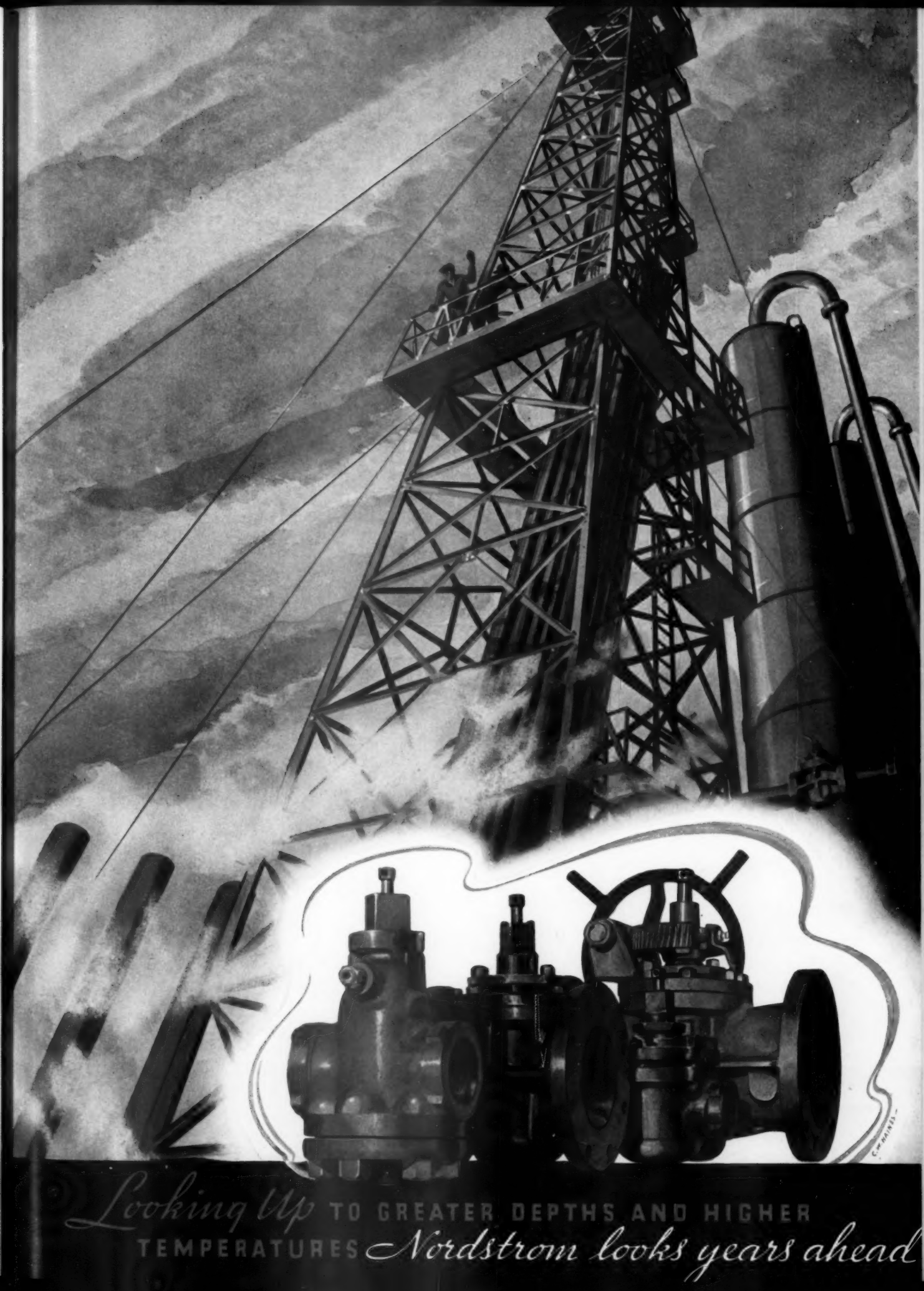
15,000 Dealers Sponsoring Air Conditioning Week

Over 15,000 warm air heating and air conditioning dealers and contractors throughout the United States, in connection with furnace and air conditioning manufacturers, are sponsoring a nationwide movement known as NATIONAL WARM AIR HEATING AND AIR CONDITIONING WEEK.

The movement was put into motion on June 20th following the general announcement made by the manufacturers of warm air heating and air conditioning equipment at their National Convention held in Columbus, Ohio, on June 16-17-18.

This nationwide movement includes complete educational activities on the parts of the manufacturers, dealers and contractors, to clear up in the minds of the present and potential users of warm air heating and air conditioning, winter and summer, the confusing statements and claims being made in national advertising and sales literature by the many new interests entering the field. This educational plan covers the proper and true definition of air conditioning, its proper functions and its correct installation.

The movement is to culminate with the flying of banners, parades, heating and air conditioning displays and expositions in all localities during the week of August 17 through August 22nd. This week has been designated as National Warm Air Heating and Air Conditioning Week.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TEMPERATURES Nordstrom looks years ahead

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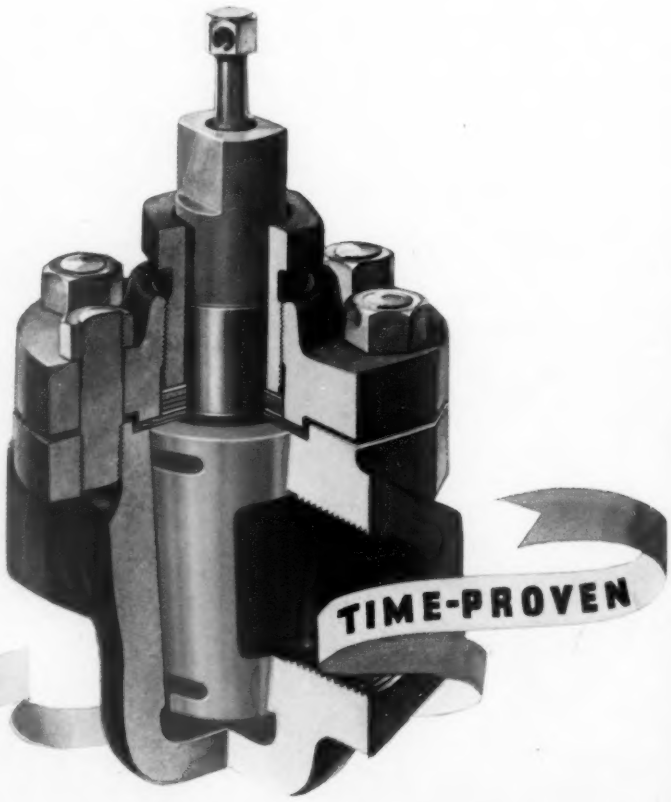

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Validity of Gas Franchises—

And the Rights and Obligations of Utilities under Them

By Leo T. Parker

Attorney at Law
Cincinnati, Ohio

VARIOUS Courts have held that the validity of a franchise always depends upon whether its provisions are authorized by the state constitution when construed in accordance with the intended meaning of the one who originally formulated the constitution. Therefore, unless the state constitution authorizes the granting of franchises in the manner designated by a state law, or city ordinance, the franchise is void.

With respect to the right of a municipality to grant a franchise, and enter into a contract with a gas company for distribution and sale of gas, it is well to realize that a city has two classes or kinds of powers: One, legislative or governmental, in the exercise of which it acts as a sovereign; the other, proprietary or business, in the exercise of which it acts and contracts for the *private* advantages of the city and its inhabitants.

Generally speaking, in the exercise of governmental powers, the officers of a city cannot make a valid grant or contract which will bind the municipality beyond the terms of their offices. The Courts have adopted this rule because no municipal official may lawfully circumscribe the legislative powers of their successors. On the other hand, in the exercise of the business or proprietary powers of a city, the officers are limited by no such rule and they may lawfully exercise power to make contracts in the same manner and for the same purpose as other private business officials.

In order to induce companies to install expensive equipment it is, as a general rule, necessary that the municipal officials shall grant to these companies exclusive rights for a reasonable period. Such grants are usually termed franchises.

A franchise has been defined as follows:

"A franchise is a right or privilege granted by the sovereignty to one or more parties to do some act or acts, which they could not do without this grant from the sovereign power." (106 P. 962)

Also, in Sapulpa V. Oklahoma Natural Gas Company, 79 Okla. 196, it was held:

"A municipality, in granting a franchise to a gas corporation, which permits the use of the streets and alleys for the purpose of furnishing the citizens with gas, acts as a governmental agency of the state."

Two Valid Gas Franchises

Generally speaking, the Courts have held that a municipality may grant two or more valid franchises to different corporations for the distribution and sale of gas, providing the first granted franchise is not *exclusive*.

For example, in Rayville Gas Company V. Louisiana Public Service Commission, 125 So. 130, it was shown that a municipality granted a valid franchise for the distribution and sale of natural gas in the city. A few years later, by an ordinance, the city granted a similar franchise to another gas company. In this latter franchise the gas rate was fixed at one-half the rate specified in the first granted franchise.

The Court held the franchise valid, saying:

"The power to grant franchises has been vested by the Legislature in the municipalities of the state . . . It is well settled that: 'On the grant of a franchise not in terms exclusive, there is no constitutional obligation on the state or municipality not to grant to another corporation a similar franchise, even though the latter greatly impairs or destroys the value of the former. . . . No franchise will be held exclusive unless the intention to grant an exclusive privilege clearly appears' . . . "

Must Extend Service

Also, the Courts in different states have adopted the rule that unless a gas company has an exclusive franchise both the city and the Public Service Commission may authorize another company to lay mains and enter into the business of selling gas, if it is proved conclusively that the company which first received its franchise is not giving adequate service. Moreover, the company is bound to enlarge its system in consideration of the reasonable requirements of its consumers.

For instance, in Gas Company V. Public Service Commission, 295 Pac. 668, it was disclosed that a gas company had a franchise to supply gas to the inhabitants of a municipality. The company failed to supply gas to many of the inhabitants who demanded the service. Another gas company obtained a permit under a city ordinance to lay its lines. Although the holder of the original franchise complained to the Public Service Commission, the Court upheld the validity of the permit, and said:

"Appellant (Gas Company) seems to have the notion that, as long as there was a plentiful supply of gas furnished by it at the burner tips to the consumers then on its mains, it had fully discharged its duty to the public. This is not the rule. As long as there were any substantial number of consumers of gas who wanted gas and could not get it, the appellant (gas company) was not meeting the public convenience, and the commission was justified in finding that public convenience required another company, when such a company presented itself ready to serve."

Law of Ambiguous Franchises

It is well established that a franchise granting an exclusive privilege to a corporation to supply a municipality with gas for domestic and public purposes for a *reasonable* period is valid, provided the grant originates from an authoritative source. (172 U. S. 1).

On the other hand, the Courts never presume that the word "exclusive" was intended to be included in a law granting a franchise to a gas company. This rule of the law is applicable although the officials of the gas corporation believe the cor-

poration possesses an exclusive franchise and proceeds to raise money for improvements which it would not ordinarily raise, without belief that its operations are protected against competition.

Another important ruling was put on record by a higher United States Court in the recent case of City of Laurel V. Mississippi Gas Company, 49 F. (2d) 219. In this case the Court held that a gas company having a franchise to manufacture and distribute artificial gas, impliedly, has the right to distribute natural gas through its mains and sell it under this same franchise.

The facts of this case are that a municipality granted a gas company a franchise containing a clause which specified that the gas company "shall be and it is hereby granted a franchise for a period of 25 years . . . with full right, power and authority to establish, construct, maintain, extend and operate a plant of machinery, mains, pipes and other apparatus and appliances within the corporate limits of the city . . . for the purpose of *generating and furnishing* to the city and its inhabitants, gas for light, heat and other purposes . . . " The gas company manufactured and sold its *artificial* gas for many years.. Later the gas company officials applied for a permit to lay additional mains for the purpose of distributing *natural* gas. The city officials would not grant the permit unless the gas company reduced its rates, explaining that the franchise referred exclusively to artificial gas, and for this reason the franchise did not grant the right to the gas company to distribute and sell natural gas. However, it is important to know that the higher Court refused to uphold this contention, and said:

"The sole question presented on this appeal is whether the gas company has the right to distribute natural gas through its existing system and to extend that system under the provisions of its franchise. Of course, a public franchise is to be construed in favor of the public, but nevertheless it must be given a just and reasonable construction. . . . The main object to be achieved was the supplying of gas for heating and lighting. . . . It is merely incidental to the furnishing of gas that it be first manufactured."

The Law of Perpetual Franchise

While it is true that an ordinary gas franchise is not usually deemed a violation to anti-monopolistic laws, yet any law or provision intended to make the franchise perpetual is void. Moreover, any law is void which in effect makes a franchise perpetual until another law is passed to revoke the franchise or permit.

For example, in Oklahoma Natural Gas Corporation V. State, 284 Pac. 40, it was disclosed that a state legislature enacted a law providing that all cities within the state should cancel previously issued gas franchises and issue to each gas company a special form of permit. The law further provided that the permits could not be revoked except by the state legislature.

In holding this law void, the Court said:

"The utility surrendering the franchise shall, by operation of law, receive in lieu of such surrendered franchise a permit from the state, revokable only by the legislature. . . . Such permit in effect authorizes the converting of a limited franchise granted by a municipal corporation into a perpetual franchise, and therefore violates the Constitution which declares that perpetuities and monopolies are contrary to the genius of a free government and shall never be allowed."

In 1929 the council passed an ordinance making it unlawful for the gas company to charge for gas more than 40 cents per 1,000 cubic feet. The gas company filed suit to prevent enforcement of the ordinance on the grounds that the provisions in the charter, which gave the company the right to supply gas at any price contracted by users, prevented the city from limiting the rates charged for gas, although the above mentioned state law delegated that power.

However, the Court held the city within its rights to enact a reasonable ordinance restricting the gas rates. This Court said:

"The power to regulate rates of public utilities is inherent in every sovereignty. It is legislative in character and is a part of the police power. The state may, within limits, contract with a utility as to the rates to be charged, yet it may well be doubted if, under the modern rule, it can irrevocably surrender all regulatory power. Certainly no such surrender is to be presumed. On the contrary, every presumption is against any such surrender. A charter provision claimed to work such a surrender must not be construed if any other construction is reasonably possible . . . "

Right to Contract

Any contract that is properly authorized by law, and is reasonable, and legally sound, is valid and enforceable by the terms of which a municipality grants a franchise and enters into a contract to purchase gas at a stipulated price.

For instance, in Griffin, V. Natural Gas Corporation, 37 F. (2d) 545, it was disclosed that a city entered into a contract with a gas company, whereby the city agreed to purchase from this company all the gas required by the city for fuel in the operation of its waterworks power plant, and the city agreed to use only natural gas for fuel in the operation of such power plant. The contract contained a clause which relieved the gas company from failure to furnish the gas where such failure resulted from causes beyond its control. On the same date the city and the company entered into another contract by which the latter agreed to furnish gas to the inhabitants of the municipality at a stipulated cost and gave the gas company the exclusive right for five years to furnish to its water plant and to the inhabitants.

Suit was filed by certain citizens on the contention that both contracts were invalid because the franchise which gave the gas company the exclusive right to furnish the gas for the water plant and to the inhabitants for five years is a restraint of trade since it prevents other gas companies, which may desire to do so, to furnish gas for these purposes. However, it is important to know that the Court held the contracts valid, stating the following important law:

"A franchise is a special privilege conferred by government upon individuals and which does not belong to the citizens of the country, generally, or common right. . . . We think, in view of the expenditure necessary to be made to furnish gas to the city and the fact that the city was the only customer for such gas, an exclusive contract for a period of five years was reasonable . . ."

Company Bears Expense

Various Courts have held that, although a gas company holds a franchise and is authorized to lay its pipes in the public streets, the company takes the risk of their location and is bound to make such changes as the public convenience and security require, at its own cost and charge.

For instance, in a leading case, Transit Commission V. Long Island R. Company, (171 N. E. 565), it was shown that a municipality decided to eliminate a railway crossing. Previously a gas company had been

(Continued on page 40)

Research In Public Relations

By Clark Belden

Executive Secretary,
The New England Gas Association

HAVE your public relations improved in the last five years? Do you know? How do you know? If improved, how much? Why? If worse, how much? Why? How recently have you checked these factors? Why did you check them? How did you check them? Did you use an effective method? How do you know it was effective? If you discovered that certain improvements were necessary, did you put them into effect? If not, why not? Have you ever made any customer-opinion surveys of any of your contact procedures? What did you discover? What did you do about it?

Do you face all of your discoveries in the field of public opinion honestly or do you tend—perhaps half unconsciously—to rationalize them, to use too much "I viewpoint" and too little "you viewpoint"? Is your public relations program a continuous one or do you "work at" it, so to speak, by fits and starts, chiefly when some of your customers throw a few fits and start something? How much research and outside study have you devoted to this field in the past year? How did this research improve your own program? If you didn't study the policies, procedures and developments of other companies and other industries, did you feel that your own program was perfect or was it because you didn't wish to take the necessary time or didn't this research occur to you?

The chief purpose of this paper is to present the public relations question from an angle that will stimulate thinking, in the belief that such an approach will open up some new ways and means and perhaps modify some current ones. Consider the different perspectives which we gain when we study the portraits of some famous man whom a dozen different artists have painted. We see the same man—but through different eyes. There are several approaches to every subject and we must find as many as possible to the public relations question. We can go stale on a subject by viewing it too long from one spot.

Presented before the New England Gas Association Meeting, Accounting Division, Springfield, Mass., June 11, 1936.

Studying Public Relations

It is enlightening to look about the business structure these days and to observe the companies in a variety of industries which are for the first time studying this public relations question in its several ramifications and whose leaders are beginning to see ways in which intelligent and sustained effort can aid their business development. The field of public relations, using the term broadly in this paper to include customer relations and a dozen or more other related activities, is a relatively new one. For some years, its growth was very slow and activity in it was largely confined to the several types of utilities.

During the past half dozen years, business concerns outside of the utility field have, perhaps because of increasing competition and perhaps because of increasing buying selectivity, adopted public relations programs, many of which are both comprehensive and productive. Some of these activities have led to the establishment of organizations of public relations consultants and to a new interest in this field by some of the leading advertising agencies. And yet—the direct and repeated contacts between many concerns adopting these programs and their customers are far less than between the utilities and their customers. This recent development, therefore, merits the thought of all utility people. Its significance should not escape us.

What Are Public Relations?

Public relations are, according to one observer outside of the New England utility industry, the most discussed and the least executed of any activity in the business structure. If this be true, is it not because their importance is perfectly acceptable on a theoretical and an objective basis but that the results are considered hard to measure because they are apparently so intangible? If customer contacts are apparently proceeding smoothly enough, many people consider that planned public relations programs are of minor importance because the results cannot be checked as can last month's purchases, production, shipments, sales or collections. There are no tangible figures, so this reasoning goes, that we can put on paper and thus it must be that there is nothing to add up and total at the bottom of the column. Seemingly, this activity suffers when compared with other company activities.

However, if we will view the negative side of the question, a lack of results can often become painfully tangible—and expensive. Perhaps too much so for our own temporary peace of mind! As the tangible is all that impresses some types of people, it is only then that these people become interested in this question and then often for a brief time only. That is, until the engine seems to run smoothly again. Their interest is of quick desertion. Then the subject seems to those people to have become intangible again—to have floated off into the clouds—and their thoughts are devoted entirely to other questions. Their acquaintanceship with the subject is only a nodding one, with the nod frequently well disguised.

In this fashion, some people see-saw from that side of the road which admits of no interest in the question over to the opposite side of the road which compels a very feverish interest. However, when the compulsion resolves itself, the cycle repeats. Blowing hot—then blowing cold. The point has been missed completely and the events might just as well not have happened as far as any permanent lessons having been learned.

Lack of Interest

Some executives in various industries have been charged with lacking a serious interest in this subject. Cannot this charge be explained by the policy of vacillation, particularly as this shifting and reshifting process seems often to be an unwitting one? Consistency is said to be a rare jewel and it sometimes seems as

though it were more rather than less rare in the field of public relations. If there is any one vital truth that should be learned about public relations activities, it is that they should be year-round rather than part-time, like the meals we eat each day rather than the vacation we take once or twice a year.

Some business men whose ideas are generally sound have been heard to utter opinions on and have been observed to follow procedures in this field which are amazing. In this respect, the subject seems to resemble play writing. Many people think they can write a Broadway play and, of course, they intend to do it some day, just as soon as they get a little extra time from their bridge, their poker, their golf, their required reading of the daily sensations, their pressing social engagements and the other vital factors that constitute their life outside of business hours. So, too, with public relations. The field is crowded with self-made experts but suffers from a shortage of real experts. Perhaps this is a question of the old adage that a little learning is a dangerous thing. There has been much superficial consideration of the subject but far too little penetrating and sustained analysis.

On the surface, the subject is one that can be mastered in an evening, like the contents of a popular magazine. Its theory is quite obvious! But this is deception, pure and simple. If any person doubts this warning, let him go to any large library and assemble all of the books, some of them volumes of six or seven hundred pages, which are available on public opinion, human relations and allied matters. The assembled volumes will give him a bad headache if he attempts to absorb their contents in less than fifty weeks, working two hours a day. Most of this material is of a meaty type, requiring reflection as well as careful reading.

More Hindsight Than Foresight

An old adage runs to the effect that foresight is better than hindsight. Again, if some of you have taken the time to present yourselves at our libraries and secure any of the books that have been written in recent years about some of our great captains of industry and the interests which they dominated, you must have been impressed by the fact that they often displayed—at least from a public relations angle—more hindsight than foresight. It is not necessary to mention industries or companies and make invidious comparisons. The point is that the lesson is there for those who will take the time to secure it.

Even though this lack of foresight occurred in a period when the words "public relations" had probably never been uttered and when that famous remark of "the public be damned" expressed a substantial sentiment of the day, nevertheless the evil chickens came home to roost in later years and probably, indirectly at least, gave birth to a host of reactions and reforms that, cumulatively, marked the gradual entrance of new relationships between business and the public, relationships which have over the years become of increasing conscious concern to both groups. Herein lies the foundation of the public relations movement. We are primarily interested tonight in our own individual part in the developments of today, in the erection of the superstructure.

In discussing hindsight and foresight recently with a corporation official who has done some thinking about public relations, he remarked to me: "How true it is that public relations work with some people is scattered all over the lot! A chap wakes up some morning in a heavy fog because some event has unpleasantly affected his company. Something has happened! Perhaps the boss will hang it on him! He rushes to secure the printed proceedings of his trade association to grab some quick knowledge of the printed proceedings, he discovers curiously enough that two or three or four years ago suggestions were put forth at some meeting which would have prevented the present trouble if he had been smart enough to have followed them at that time. But not everybody is that smart. That's where the catch is."

Be a Jump Ahead

Yes —it pays to be a jump ahead rather than a jump behind our problems and our responsibilities. The three-two baseball pitcher is apt to be in trouble because he is behind rather than ahead of his situation. The smart baseball pitcher, the fellow who compiles a seven hundred average at the end of the season, is the one who keeps ahead of the batters. We must invest more time, thought and study to keep ahead of situations but we shall meet our business responsibilities better if we make the investment.

Generally speaking, there has been a noticeable improvement in the public relations activities of the New England gas companies in the past five years and a substantial improvement in the past ten years.

For instance, I know of one large New England gas company wherein, a dozen years ago, the president personally dictated every letter concerning complaints or policies which was sent to any customer. This activity was solely and entirely in his hands. Nobody else in the company was supposed to know anything about such things or have any ideas regarding them and certainly not to do anything about them. To have done any of these things, certainly the latter, would, I suspect, have been the cause for instant dismissal. Of course, this peculiar policy was a costly one because none of the contact employees were able to do what they should have been doing in their daily handling of customers and, consequently, this defect simply added fuel to the fire and made more letters for the president to sign.

How Policies Change!

In the past few years, there has been a tremendous change in the public relations set-up of this company with the result that its contact employees today have been well trained in this activity, they hold periodic conferences to study their problems, and they are qualified to handle long lines of customers speedily, accurately, and pleasantly. Yes—questions, complaints and everything else. Without calling for help every three minutes, either. And today, intelligent letters regarding all sorts of policies, procedures, complaints and inquiries go forth daily over the signatures of various supervisors in this company's commercial department. The present president is busy solving larger problems.

This set-up of a dozen years ago was fairly wide-spread at the time. But not so today! We know considerably more about this question than we did a few years ago and we are learning more each year. By and large, our employees, when prepared for this work, have made the grade, showing that they can meet responsibilities which the president of the company just mentioned felt a dozen years ago to be quite beyond them! Doubtless the next dozen years will witness still further developments in this direction and we shall then be looking back and measuring the advance just as we are tonight.

It is important that the top executives of any company in any industry which has more than a theoretical public relations interest understand public psychology, human nature, human desires, social and economic trends, and the specific public opinion affecting their industry and their

company, whatever it may be. Here again, some real research, both of theory and of practice, serves a valuable purpose. These days, there is tremendous thought, activity and financial expenditure in many fields along research lines. In fact, this might be termed the age of research, the day of discovery. This public opinion field, which is both complicated and somewhat elusive, warrants at least its share of today's research by our industry—a utility—above all industries.

Policies are no stronger than the soundness and the depth of the observation and the thinking behind them. If public relations policies, whatever the company or the industry, are to be even 75% efficient, not to mention 95% efficient, there must be both a broad and a deep understanding of all sides and of all views. The policy setters must know their stuff! Blunders can start at the top!

The Test Tube and the Laboratory

This thought suggests the test tube and the laboratory. In chemistry, we have various elements which, when combined, produce startlingly different results. So, too, in the field of public relations, there are many different elements or factors which, when combined, produce a wide variety of results for or against business concerns. Some combinations —good results. Other combinations —just the opposite. We must adopt the approach of the research chemist. We must continually observe these different elements or factors in the public opinion and human relations field and also the possible bad combinations and good combinations, lest we permit several elements to combine in dangerous proportions and blow off the roof. Indeed, there is a complex field for study here and we cannot secure good working results in any complex field unless we analyze it with an engineer's thoroughness and reconstruct it with a scientist's vision.

All contact employees should have a working knowledge of these matters commensurate with their duties so that each of them can do good first aid work in the initial stages of any threatened undesirable combination of elements or factors. This thought recalls the principle of having periodic physical examinations as it is much easier to treat physical defects in the initial stages than it is to try to halt them or eradicate them in later stages. Personal irritation tends to feed upon itself. Give it opportunity or the slightest encouragement and it can quickly increase its intensity to embarrassing proportions. The obvious lesson is that we should not leave opportunities scattered around where customers can stumble over them! After all, causes precede and produce effects. Watch the causes!

Qualified Contact Employees

Our contact employees can, when they are qualified, and only then, render valuable service in removing potential causes of trouble. They are, in effect, a sprinkler system for the fire of personal irritation. This kind of fire can spring up in people more readily than fires start in factories and office buildings. Consequently, the desirability of our having an efficient sprinkler system at all points in our customer-contact relationships.

Of course, we can do considerable fire prevention work in the field of personal irritation and we should do so, as already suggested and as will be further suggested later. In fact, our research program should produce many preventive clues, just as medical research has developed preventive medicine. Fortunately, the medical fraternity was moved by the thought that "an ounce of prevention is worth a pound of cure." True in medicine, how true in the public relations field! If adequate research and planning unite to give us good policies and procedures and if adequate supervision gives us good execution, we shall be able to reduce to a minimum the fires of personal irritation which our sprinkler system of contact employees is called upon to quench.

You may wish some concrete suggestions applying to the gas industry. You men who spend every day in close touch with the specific technique of these matters could doubtless cite other suggestions than those I shall present. However, it can at least be said that the following thoughts, presented as questions, represent procedures that are not by any means employed by all companies. Some of these procedures are now employed by only a few companies. Several procedures are probably not yet employed by any companies. You may be of a mixed opinion as to some of these suggestions but I suspect that, if a spot check were made here, you would be found to vary somewhat among yourselves as to the feasibility of individual items. I do not suggest that you put all of these suggestions or any of them into effect tomorrow morning but I do think that it would pay you to give some thought to them. There may be many duds and few bullets among them but it is often worth while to look over a pile of duds to secure a few bullets.

Specific Policies

The following possibilities do not embrace the entire company but cover only the Commercial Accounting Department as it functions in most of our gas and gas and electric companies. There are also, naturally, specific policies and procedures of public relations which concern chiefly the Operating or the Sales Departments. There are also several that transcend departmental lines and concern the company as a whole. But we cannot discuss these other phases tonight. Of course, the various fundamentals just outlined apply with equal force to all departments —to the company as a whole—although the specific procedures used by and in each department will naturally vary because of the different conditions under which the representatives of each department approach the customer or the public. Several Operating Division questionnaires have, in part, developed some good material from that department's viewpoint and several papers presented before both the Operating and the Sales Divisions have touched upon this subject from the viewpoint of these two departments.

Let us first mention the several types of Accounting Department representatives that have customer-contact duties. For instance, here is the layout for one group of companies more or less typical of the industry. We have the application or service clerk, the credit clerk, the meter reader, the bill deliverer, the adjustor, the cashier, the accounts-receivable clerk handling telephone calls regarding bills, the collector, the chief clerk, and the customer's deposit clerk. Company arrangements of duties are not identical and this prescription may not duplicate yours but it probably closely approaches it.

It must be apparent that these contact employees should not function so as to build ill will for their companies. Have you ever thought of these contact employees as being the ones who constantly cross the circle that encloses the field of public relations and distinguishes it from other company activities? Certainly we cannot afford to have them stubbing their toes inside of this circle, of all places. Should we not take a good look at this circle in each company and make certain that the sidewalks and streets inside of

(Continued on page 35)

Unique Sales Contest

Exceeds Quota for May

By R. S. Ellsworth

"THE Quota for May," said Pat, "will be $100,000." Just like that—as though $100,000 was an everyday sort of quota for an outfit like the Minneapolis Gas Light Company, Minneapolis, Minn.

Pat Boyer, Sales Manager, probably chuckled to himself as he looked around at the faces of his half-stunned salesmen. A hundred thousand dollars. It was the largest quota ever set; and it seemed an impossibility.

Nor was that the only bombshell Pat threw into the camp of his salesmen that morning. It seemed there was to be a contest; not just a plain or garden variety of contest, but one of the most unusual contests anyone had ever heard of.

"Each of you, in effect," said Pat, "starts this contest absolutely nude. There are twenty garments to be won, and the quota of each man has been divided by twenty. As you win each garment, by selling a twentieth of your quota, that garment will be attached to the manikin which represents you." At this point, Pat produced seventy manikins, about two feet high, printed in colors. A portrait of each salesman was attached in the proper place, giving a decidedly realistic effect. Some of the older men, with their white hair, were quite flattered by the athletic body of the manikin which represented them, and there is no doubt that a good many of the salesmen whose waistlines had been slipping for a few years, wished that they could strip down to the buff in such an effective fashion.

Anyway, there they were at the start of the contest: Seventy salesmen without a garment to their names, and an apparently impossible quota to make, in order to become fully dressed.

"At the conclusion of the contest," continued Pat Boyer, "there is going to be a banquet. It's going to be a big affair, and representatives of the various companies whose products we sell will be on hand. The best thing about this banquet is that each of you will appear in the garments actually won by you—no more, no less. It's entirely up to you to determine whether you will appear fully dressed and in your right mind, or whether you will eat standing up, encased in a barrel. Now go to it!"

It was a strange contest. The men built fires under each other, and under themselves. None of the usual pumping up, in order to keep the contest going seemed to be necessary. The first weekly sales meeting was a gala affair, with the men interested as children in the business of dressing the manikins which showed so graphically the standing of each man in the contest.

A weekly bulletin, called BARE FACTS, appeared each week during the contest. We quote from the issue which was distributed at the meeting at the close of the first week:

"At 8:30 last Monday morning all the boys gathered at the Builders' Exchange, Room 814, to make merry.

"To start the ball rolling, Shipwreck Kelly tripped into the room. Much after the manner of a strip dancer at the Gaiety, he divested himself of his clothing, until, clothed only in a dainty negligee of heavy red wool, he seated himself at the piano, amidst tumultuous applause from the onlookers.

"Everyone, to warm up, joined in the choruses of two songs. Then, as the meeting livened up, dainty little Cliff Porter, that hip shaker from the South, ankled onto the stage, clad only in a becoming pair of lace shorts. Not to be outdone, Cleo Marrin appeared in a shimmering chemise, enhanced in its gorgeous glitter by a rather well-filled silk brassiere."

This brief extract will give you some idea as to how the contest idea was developed. Sales started piling up. The $100,000 quota still seemed

Before:—Read the story for the "Bare Facts" of this contest.

like a tough one, but the boys were working as, perhaps, they had never worked before. They were working to make a quota, they were working to make money for themselves, but they were also working to put themselves in a position where they could kid others, instead of being kidded. No man is an object of beauty, clad only in his shorts, his undershirt, and one sock.

Well, the contest got better and better as it went along. Near the end of the contest, this statement was made by J. K. Swanson, the Vice-President and General Manager of the Minneapolis Gas Light Company:

> "I appreciate very much the spirit of cooperation you men have displayed during this whole contest, and especially that expressed for the ensuing three days.
>
> With such a spirit, nothing can prevent our company from making the quota of $100,000 set for the month of May.
>
> I wish to take this opportunity to thank each man individually."

A special effort was made during the last three days to boost the sales over the $100,000 quota which had seemed so impossible at the time that the quota was set. The men were spurred on by a get-together breakfast given by Mr. Swanson. Not to keep our readers in suspense any longer, let us say at this time that when the contest was over, and the figures compiled, the total was not $100,000—it was $123,000!

The big, much-talked-about-banquet was held the evening of June 9th. Practically all of the men were dressed, as can be seen by the accompanying photograph.

Each man was presented with his manikin dressed exactly as he had finished in the contest. There was a parade of these manikins, led by a little German band, terminating in the award of a statuette trophy to the high man in each of the four divisions of the company.

There was something doing every minute. When the little German band wasn't playing, a snappy orchestra known as "Four Knights of Note" provided music. Then there was a special "broadcast" which high-lighted incidents of the contest, burlesquing a radio program in a most entertaining manner. The boys indulged in mass singing which could have been improved in quality, but certainly not in spirit. A monologist gave an imaginative account of the contest in Swedish dialect, which had the boys rolling on the floor. Then there was a cute little dancer who apparently hadn't done so well in the last sales contest she was in, since she had apparently made about one-half of one-twentieth of her quota. She may not have been a good sales person, but she seemed to satisfy in other respects.

One of the scheduled features was to have been an address by J. K. Swanson, Vice President and General Manager of the Minneapolis Gas Light Company, but Mr. Swanson was unfortunately called to New York on important business, and instead of a personal address, a note of appreciation and greeting from Mr. Swanson was read by Pat Boyer.

The banquet was made possible by the cooperation of the following manufacturers and their representatives.

J. H. Fagan Company, Jack Fagan

A-B Stoves Incorporated, Ross Lynn

Servel, Incorporated, R. C. Bon Seigneur

General Gas Light Co., E. W. Kriekard

Ruud Manufacturing Co.

Sands Manufacturing Co.

Bryant Air Conditioning Corporation, C. E. Frary

Roberts-Gordon Appliance Corporation, Bill Gordon

Surface Combustion Company, H. C. Gurney

Minneapolis-Honeywell Regulator Co., Harry Jenkins

McCord Co., Inc., Russ McCord

The following paragraph appeared on the face of the special souvenir program presented to each person attending the banquet: "To you who have lent your aid in this epoch-making victory over the largest quota this company has ever undertaken, we give our thanks. We thank each salesman whose loyal cooperation and willing spirit bear testimony to the fact that our organization is a company united."

It might be mentioned in conclusion, for the benefit of those who might be interested in staging a similar contest, that the contest idea and material were supplied by the Hahn-Rodenburg Company, Springfield, Illinois, who have copyright and patent protection. Any additional information regarding such a contest may be secured from the company.

After:—The quota was beaten and the banquet indicated a "clothes" finish.

Gas House Heating Sales Methods And Results

By

Henry J. Mandel

New York State Electric & Gas Corporation,
Lockport Division, Lockport, N. Y.

THE problem of building the gas load rapidly is one which is confronting practically every gas company in the country. Gas house heating offers one answer to this problem. However, a detailed analysis of the potential sales must be made in the territory and the economics of any plan be determined. Consideration should be given the sales resistance to be expected, costs of other fuels, gas rates and a sales plan which would prove helpful to the sales organization. The plan should be flexible so as to meet the seasonal demands.

This division consists of the City of Lockport and about twelve towns which string out over a fifty mile run of our pipe line, reaching almost to Rochester, N. Y. We have approximately 7000 degree days per heating season.

Potential Prospects

There are about 5400 gas meters in this division, of which only approximately 1000 are potential gas heating possibilities. The heart of the City of Lockport is supplied with city steam by our company which limits our sales in the steam heating district. There are also a number of commercial gas meters which are not open to gas heating. There were approximately 90 gas heating installations in this division as of June 1, 1935.

It was decided that on June 1, 1935 we would start a gas house heating campaign for 150 installations by the end of May, 1936.

The gas heating department consists of a supervisor and three especially trained gas heating sales engineers. One sales engineer works in Lockport, one half time on city steam and one half time on gas heating. Another also works on gas heating in Lockport and the third has the rural towns, out of Lockport. These men keep strictly to their assigned territories. They are paid on a salary basis plus bonus if quotas are reached.

Presented at 1936 Metropolitan Regional Sales Conference, May 21, 22, 23, Lake Mohonk, N. Y.

Rate Reduction

We anticipated a gas heating rate reduction to become effective September 1, 1935. The old rate was 60c per 1000 cu. ft. and the new rate averages 53c including demand charge. This is manufactured gas of 540 B.T.U. value. These rates are two-part rates, carrying a demand charge of $3.00 per 100 cu ft. demand and a commodity charge of 44c per M. This rate applies to all gas used in the home for domestic use, as well as house heating purposes.

It was determined from past experience that the greater number of heating units sold would be conversion burner units. Straight gas designed units were recommended only in cases of new homes or where old heating plants required replacing.

The Sales Plan

It is in order to mention the sales plan at this time. Ours is a straight sales plan. The conversion burners were installed at the average price of $180. Including plain room thermostat and limit control. We added $27 for a chronotherm. Our sales contract called for a 10% down payment and balance over a period as long as four years if necessary, with a carrying charge on the unpaid balance of ½ of 1% per month. A cash sale was on a 30-day basis and in a few cases on installation.

We guaranteed the equipment on a money back basis; if the customer is not satisfied with heating qualities and operating costs anytime in the first nine heating months, providing notice of dissatisfaction was given and we were afforded an opportunity to correct any trouble. In straight gas fired heating equipment we asked 10% down payment and 6% per year on unpaid balance, payments being spread over two years.

Relative Fuel Costs

Hard coal is selling for an average of $13 per ton, semi-hard coal for $8.25 per ton, coke for $8.50 per ton over a five-year period and oil for 7¼ cents per gallon. We applied the saving effected on the domestic gas used for cooking and hot water heating, towards the gas heating costs, which makes the gas costs equivalent to $13.50 hard coal. But if gas is used in the residence for heating only it would be the equivalent of $18 coal. Therefore, it becomes necessary to sell the prospect a completely gas equipped home with such appliances as gas range, water heater and gas refrigeration so as to make our gas heating figures more appealing. Our rate compares favorably with 8½c oil when gas is being used for domestic load. We budgeted many gas heating bills over a ten-month period, starting with September billing.

Service Department Aids

We will now switch off direct sales work to the work of the installation and service department. In the first instance we might say that without the complete cooperation of this department no sales

project can be a success. During much of the heating season sales depend upon the prompt action of the installation and service department. Meters of greater capacity must be set and in a few instances larger gas services must be run promptly. Then when it comes to service after installation, nothing can hold gas heating installations as effectively as prompt and efficient service.

The sales supervisor every morning conducts a round table discussion of the happenings of the day before and of what we propose to do that day. All points of sales resistance are discussed and solutions proposed for overcoming all difficulties. For example we were encountering a great deal of oil burner competition. We weighed this question over carefully and decided to bring the pressure to bear on those prospects who were considering the purchase of oil burners. They were given the "facts" in no uncertain terms. We sold them gas heat or they stayed with coal and did not buy oil. We preach "get the facts." We find that this works out successfully and we have taken sale after sale away from oil burner salesmen. This has about stopped oil burner sales in this territory but we have to keep right on them to hold our position.

Meeting Competition

In beating down oil burner competition we have used a photostat copy of an article published by Wallace E. Pratt, vice president, Humble Oil and Refining Co. in the Oil and Gas Journal under date of May 2, 1935. This article brings out that the discovery of oil fields in the last five years will not support the use of oil for longer than 12 years and that during this period the cost of oil must increase. We also bring in the facts regarding the total oil heating costs, aside from bare oil costs. These include additional cleaning costs in the home, cost of about $12 per year for electric motor operation, service and replacement of parts, depreciation and interest on investment. The objection of noise, odor and fire hazard is also impressed upon the prospect.

Publicity and Window Display

Our newspaper, direct mail, and circulars are all stressing "get the facts" about modern gas househeating. Daniel Starch and Staff furnishes our newspaper advertising material, etc., and it is proving very effective.

A 4 ft. by 5 ft. map of Lockport division is placed in our gas office window, with red pins indicating all gas heated homes in this division. A place card indicates that there are "Now more than 250 gas heated homes. Is yours indicated on the map?" This map creates quite a lot of interest and has proven well worth the effort. Each sales engineer carries a small map with red ink dots, to show prospects when giving the "facts" on gas heating.

Sales Methods and Surveys

Prospects are obtained by consistent "door bell punching." The entire morning is used for this purpose, almost to the exclusion of all other work. Afternoons and evenings are used for call backs. A form called "Sales Help and Daily Work Organizer" is used by each man to organize his daily work and keep records, which later prove helpful. These forms are dated about 8 months in advance and call backs listed ahead so that when a day arrives, the work for that day is well lined up. The section "Today's Contacts" is filled out with names and addresses in advance. These names are taken from the city directory or our ledgers, so that our men call the home owner by name on the canvass call. A large amount of night work has been done during this campaign. We define a good prospect as one who permits us to make a heating survey.

All surveys are made on the Surface Combustion Heatmaster forms by the gas sales engineers. The house is sketched out and complete data is listed, including list of gas heating equipment with selling prices, which makes a complete file of that sale. All calculations are based on the B.T.U. method of figuring hourly loss of the building. Also the installed radiation is checked against the radiation demand and any existing shortage must be corrected by the owner under our engineering supervision. Chimneys are checked for poor flues and rotten brick. If necessary we sell Johns-Manville transite flue lining at cost. Out of these 165 installations we have transite lined about 20 chimneys either because of condensation trouble already experienced or in anticipation of trouble. This trouble has been experienced with straight tile lined chimneys as well as unlined. There were about 12 lined of the 90 installations prior to this campaign. A few 3-4 or 5 years after installation. We would appreciate any data as to other company's methods of overcoming chimney condensation difficulties.

Advertising Literature

The estimate for gas heating costs and cost of equipment are listed in a booklet called "Facts About Modern Gas Heat" in such a way as to bring out any possible savings and gas heating advantages over coal and oil indicating *net* gas heating costs. This booklet is left with the prospect to read over and serves as a gas heating proposal. We find that this proposal is very effective in closing sales.

The three Surface Combustion direct mail pieces "Modern Home," "Home Comfort" and "Your Housekeeping" are mailed to select prospects and also handed out by sales engineers where most good will result. These contain photographs of typical gas heated homes in this division, with approximate monthly heating costs.

The circular "10 Ways to Obtain Greater Fuel Economy" devised by Rochester Gas & Electric Corporation is used to induce gas heating customers to quote to their friends a 10-month budget cost, rather than the highest monthly bill. On the last page is a list for costs after taking out average monthly domestic gas cost, giving net heating costs. We make a practice of always stressing net heating costs, rather than gross gas costs.

The Janitrol fact book is used extensively on all sale contacts.

Contractors Cooperate

In this division we have 22 cooperative heating dealers. They consist of plumbers and heating concerns, and warm air contractors. It is our policy to turn over heating installations to them for which we pay $45. These installations are inspected by our installation and service department.

The E. B. B. (Employee Business Building) workers are giving the heating department the best of assistance and they are very enthusiastic. In fact 24 employees installed gas heat in their own homes thus far in this campaign.

We standardize on one conversion burner manufacturer's equipment and controls. This is an advantage from both an installation and service angle.

Analyzing Sales

Each month we summarize the past month's work and results in the form of a heating department bulletin which is given each employee and

dealer. The number of sales are indicated as against the quota for the month and the quota for the following month is given. There is a paragraph stressing the most important sales point for that season of the year, to be used on prospects for the following month. The last bulletin carried a list of 24 names of our employees now using gas for heating. We have approximately 150 employees. Our newspaper advertising carries a complete list of our cooperating dealers and a tear sheet is mailed to each one. The dealers are becoming enthusiastic on the subject of gas heating and a few are thinking of installing gas heat in their homes. A number discontinued the sale of oil burners and stokers to become our dealers.

The supervisor trains the sales engineers and coordinates their work with the other departments, E. B. B. workers and cooperative dealers. He also sharpshoots with the sales engineers in closing of sales.

Results

A blackboard record is kept indicating the number of sales daily and monthly. A total for each month and to date is illustrated by colored chalk. The men are thereby automatically urged to keep up with the leading man. The results of this campaign, thus far, for 150 by May 31 are as follows:

	Sales	Quota
R. M. Johnston	50	40
(One-half Gas and City Steam)		
R. M. McCormick	65	60
Charles Grigg	50	50
Total	165	150

Of these 165 installations 19 were straight gas designed equipment. Removals have totalled 3. These sales represent 3% of the total meters. The estimated annual consumption is approximately 55,000,000 cu. ft. and added revenue of approximately $33,000.00 per year.

These results could not possibly have been accomplished without the most complete cooperation of all of our company employees and their department heads, our cooperative dealers and the general interest in gas heating which was created with the public. Much credit must be given our executives who were far sighted enough to give us all the tools necessary for the heating department to close sales as readily as possible.

Total for the year to May 31, 1936 — 179 installations — approximately 120% of quota.

Trends in Lower Oven Cooking Temperatures

By

F. R. Wright

Manager, Publications Department
A. G. A. Testing Laboratories

RECOGNIZING that lower attainable range oven cooking temperatures and greater oven heating-up speeds are being constantly demanded by modern housewives, the gas range manufacturing industry of the United States has, for the past few years, bent every effort to develop equipment which will meet these new consumer requirements. As a result thermostatic control equipment is now appearing which can maintain oven temperatures as low as 200 degrees Fahrenheit for unlimited periods and at the same time pass sufficient gas during oven heating-up periods to materially reduce the time interval between oven ignition and the attainment of cooking temperatures.

Much interest is being displayed in these new type range oven accessories; and in certain sections of the country, notably on the Pacific Coast, thousands of appliances carrying them have already been sold and are giving satisfactory service. In view of the action of the Association's Subcommittee on Approval Requirements for Gas Ranges at its March, 1936, meeting in endorsing the use of low oven temperature control and burner equipment in combination with a graduating type thermostat, many gas ranges equipped with such controls are now also being produced and sold in the Eastern sections of the country.

It is generally conceded that lower maintained oven temperatures and lesser oven preheating times are "on the way" in the gas industry and will result in definite benefits to both producers and consumers. Yet the gas-consuming public must at all times be protected from experimental error during developmental stages, however desirable it may be to gain quickly the objective of developmental activity. This was the consensus of the Subcommittee on Approval Requirements for Gas Ranges at its March meeting when it ruled temporarily against approval by the American Gas Association Testing Laboratories of gas ranges equipped with pure snap-acting oven thermostats.

Whereas, snap-acting thermostats have been used for many years on gas water heaters, their application to gas range ovens is a new development of the last few months and for that reason sufficient data has not yet been assembled, in the opinion of the gas range committee, to make possible the drafting of sound requirements covering their use on ranges. The committee, however, authorized the Testing Laboratories to conduct a thorough investigation leading to the development of performance requirements suitable for inclusion in the gas range standards and which will so cover the performance of snap-acting thermostats as applied to ovens that such controls may be admitted upon approved gas cooking appliances. In addition the committee recommended to manufacturers of such controls that they equip a number of different ranges with them and submit them for actual field trials in areas where gas supplies are the most disadvantageous to the operation of snap-acting controls. This latter action was taken in order that actual service data may be available for consideration by the committee in the development of requirements and for the use of manufacturers in perfecting their equipment before placing it on the market. It is believed that the steps taken by the range committee at its March session should culminate in sounder application of low temperature heat regulation to gas range ovens.

Recent disclosure has been made that many roasting, baking and canning operations performed in ovens require, for best results, longer cooking periods at lower temperatures than have heretofore been general practice in the home. Gas range oven temperature controls permitting the attainment and maintenance of such low cooking rates will be increasingly demanded in the future according to domestic market prognosticators. That the gas range manufacturing industry is ready with equipment to fulfill these new requirements in cooking technique is indeed gratifying and is but one example of the continued alertness and progressive spirit of all gas appliance producers.

Metropolitan Utilities District of Omaha Spends $6,000 For Display Rooms

By Charles P. Rodman

FRANK LANDERS, sales manager for the Omaha Metropolitan Utilities District, is not a man to watch modernization going strongly electric, and wring his hands in helpless despair. Landers believes in action, in studying the methods of the competition and being just as progressive as they.

As a result of this policy the District built three fine display rooms within its store, fitting them with the products sold by the District.

True, gas furnaces, gas water heaters, gas refrigerators, gas ranges, fireplace gas logs, gas toasters and gas coffee percolators, were being sold by the District to many of the 46,000 homes using gas as cooking fuel, but not in the quantities desired. Why not? Because displays were not such that the rooms in the homes could be visualized furnished as the sales persons of the District talked them. It was finally decided to change all that, and at an outlay of $6,000 to build and furnish sales rooms as they would appear in the better homes of the city.

Thus, three rooms were built and furnished. First there is the basement as it should now appear in the better homes of the city, clean and convenient with gas furnace and gas water heater, a billiard table, bridge table, and games for the younger folks. The room is 18 x 22 feet, nicely painted, with floor covered with inlaid linoleum, curtains at the windows and easy chairs for all. One had but to see it to desire such a basement himself.

The living room, 22 x 22 feet, has a large fireplace in flame colored tile, with a gas log adding charm to the subdued quietness and richness of the room. Here is a circular lounge six feet across, reading table with a few choice books, copper tube chair frames upholstered in white leather. The floor has a built up covering of modernistic design. The overhead lighting plan is unique.

One views the modern kitchen through the large arch connecting the two rooms. The kitchen is 16 x 22 feet with an alcove 5 x 6 feet taken off this for the breakfast nook. The body of the floor linoleum is black. Cardinal stripes run to meet a six-foot circle of apple green, on which stands the kitchen table. To the right is the gas refrigerator; then comes a large sink with drain board on either side, and a series of convenient drawers beneath. The gas range is in white and black. Immediately above it are convenient all-metal containers for supplies and smaller utensils.

To the left of the range are metal closets for mop, broom and other necessary implements.

The charm of the entire home, however, is the breakfast nook. Here stands a table of chromium steel with cherry finished top. The frames of the two finely upholstered seats with room for four people are also of chromium steel and upholstered in white leather, kid finish.

All lighting is from glass panels set in the ceiling, which give a light that is tested scientifically and found to be easy on the eyes, yet sufficient for all purposes.

Nothing has been left undone to make the display cottage a thing of attraction to the housewife. The lawn approaching the cottage carries a water fountain as the center piece. Around this has been built a beautiful rock garden with shrubbery.

Mr. Landers is most enthusiastic over early interest in the display rooms. The first ten days, 250 people daily, mostly people never before seen in the salesrooms, viewed the rooms.

"We have completed arrangements to hold two demonstrations each week," states Mr. Landers, "and the only fear I have is the rooms will not prove large enough to care for the attendance."

Selling Hot Water By The Gallon

Customer Pays for Water Heated Instead of Gas

By

R. N. Hill

Vice President & General Manager,
Green Mountain Power Corp.

I AM indeed pleased to have this opportunity to explain and I hope, interest you in a plan which has sold gas water heating for our company and what is more important, has so satisfied our customers that they stay sold, and help us sell their friends. It is no exaggeration when I say that fully half of our leads have come from, and much of the selling has been done by, our satisfied customers.

In two years, 300 out of a total of 5,000 domestic customers have purchased heaters and are paying us an average of $4.26 per month, or $52.00 per year, and they like it. That they like it, is evidenced by the fact that we have never yet had a high bill complaint. Out of 300 heaters sold, but two have come back; one party left town and another was unable to make his payments.

Too good to be true, many will say, and I would have said so myself two years ago. The customer's acceptance of the plan has been a surprise to us. In our town gas water heating had a very bad reputation, from service cost angle. True, the original rate was high. Nearly five years ago, however, a quite favorable combination rate was filed. Still the complaints continued, and the majority of heaters sold in a drive at the time of this reduction, were out of service three years later.

I emphasize these facts to indicate that the results cannot be explained by assuming that the area was virgin and Utopian water heating territory. Vermonters have a deserved reputation of wanting and usually getting their money's worth.

The essentials of the rate are briefly as follows:

The Company agrees to heat in approved heaters, purchased by the customer, 500 gallons of water per month to a temperature of approximately 140 degrees Fahrenheit, for the sum of $2.50, which is also the monthly minimum.

The Company further agrees to heat additional water up to the limit of capacity of the customer's equipment, at the rate of five (5) gallons for one cent (1c). Approved storage heaters up to 50-gallon capacity may be used.

Contracts are on an annual basis.

The service is billed as a separate item on the regular gas or electric bill, and plainly indicates the gallons heated.

Approved ferrous metal storage heaters are sold completely installed at these prices for cash, carrying charges on deferred payments:

20-gallon—$79.50
30-gallon—$89.50
44-gallon—$97.50

Installation costs, including safety devices, material and labor, have averaged about $17.00.

Convertible heaters are recommended and every effort is made to sell a size that will be adequate with a 9000 B.T.U. burner. If however, the customer's requirements should increase, and they frequently do, it's half-an-hour's job to install 20,000 B.T.U. burners, thereby more than doubling the recovery rate.

Needless to say, great care is used in installation and adjustment to assure that maximum production, efficiency, and minimum radiation losses are realized; heat traps are installed in outlets; pilots are carefully adjusted; thermostats are set and sealed so that top tank water temperature is 145 degrees to 150 degrees at the time the thermostat cuts off. This extra care is not entirely altruistic, since the return we receive for gas depends upon the over-all efficiency of the heater.

The situation is advantageous to the customer, as it transfers the obligation of proper heater installation and maintenance to the company where it belongs.

Our return averages 95 cents per M feet for 515 B.T.U. gas, and this return has been determined by gas check meters on about 50 installations over a year's time. Several makes of heaters, and customers whose usage varied widely, were included in the test. While the return on individual installations vary between 85 cents and $1.15, the average of 95 cents is very close to the truth, and is supported by tests and calculations on heaters put through their paces when working out the details of the rate.

Judging from experience in explaining the plan individually to utility men, a number of questions have already entered your mind. Some of them I can anticipate and answer, and in doing so, will, I hope, convey the maximum amount of information possible in the few remaining minutes of my allotted time.

Your first and very logical comment would probably be: Your results to date seem to be quite satisfactory, but why not sell gas at the same rate, use it in the same heaters, which, if installed, adjusted, and serviced as well should deliver the same service to your customers at the same cost.

This is a sticker, and frankly I don't know definitely, even though I am thoroughly convinced that it just can't be done on a 95 cent gas rate, particularly if we assume that selling heaters includes keeping them sold and in use twelve months in the year. In an attempt to explain this apparent paradox, I can only say that customer confidence, customer psychology—if you wish—seems to be the answer.

When you look at this by-the-gallon rate, it just about explains itself. Every customer knows what a gallon of hot water is, though few, if any, can visualize a cubic foot of gas in terms of hot water even with the help of the best salesman or the most elaborate charts. Though our customers must for most uses of necessity buy our commodity in terms which mean little or nothing

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Presented before the New England Gas Assn. Summer Sales Conference, Swampscott, Mass., June 18-19, 1936.

to them, here is an exception. We sell them the service in understandable units of the commodity they use.

The customer feels he can make a pretty fair guess as to how many gallons of hot water a day or month will be required for his family. Invariably, his estimate is too low, in which case the salesman tells him so, often saying he will probably require, say twice, the amount mentioned. The salesman calls attention to how easily hot water may be wasted through carelessness, leaky faucets, etc. The fact that the customer becomes thoroughly conscious of wastage, is a great help later in keeping him sold, for I am convinced that the average family, when abundant hot water is available, develops habits such as letting the water run while shaving, washing dishes under the kitchen faucet, and so on, which waste about as much as the total that should be required if more carefully used.

Then, the customer may readily determine that he is getting the water he is paying for. A water meter registering in U. S. gallons is as easy to read as the speedometer on his car. Furthermore, we hang a ruled card on the meter on which the meter reader records the date and the reading each time he calls. It would surprise you to know how many customers really check their usage for a month or two after the heater is installed, all of which assists in the building of confidence.

Now, if the customer is convinced he gets what he pays for, and that wastage should be watched, he will either pay for what he uses, or conserve, providing he believes the price is fair. It will be difficult to convince him on that point, you say, but we have not found it so. One thousand gallons of good hot water for $2.00 is reasonable, and customers agree it is. But he must pay $2.50 for the first five hundred gallons. Just explain that it costs $1.50 to keep a tankful of water hot and ready for use, for thirty days and nights—then your customer will see the point.

An incident at the time of development of the rate, may be of interest. After our own tests had been completed, to check our conclusions we installed twelve (12) heaters with water and gas meters in the homes of customers, offering two months of free service and no obligation to purchase, as a reward for their trouble, and explained to them that we were trying to work out a new water heating plan. Twelve people agreed, who represented a cross-section of customers from the well-to-do down to the $30.00 to $40.00 a week class. Small families, large families, small houses, large houses, and apartments were included. After the test period, we explained the rate. Every one of the twelve purchased the heaters, and this group was of great assistance in helping sell the next twenty-five or thirty.

I do not wish to convey the impression that the plan is one hundred per cent perfect. Most of you gentlemen have had experience in selling gas water heating, and you know a perfect plan never has and probably never will be found.

It is still necessary to do a good honest job of selling, telling the customer the truth, under-selling rather than over-selling, remembering that no customer is so enthusiastic as the one who finds his purchase exceeds expectations.

The plan is designed for residential or small commercial application where the use of water is within the control of the customer who pays the bill. We will not install it for apartment house service where free hot water is furnished to tenants, neither will we furnish where quantities of hot water in excess of 6,000 gallons per month, are required. Commercial use in barber shops, soda fountains, beer parlors, and in garages for incidental car washing service, has been entirely successful as have installations in stores, banks, and business houses where hot water supply to lavatories is desired.

Features in our present rate which have offered sales resistance, are the annual contract requiring a monthly minimum of $2.50 whether the service is in use or not. This feature is not pleasing to customers who close their houses and go to camp or to Florida two or three months in the year. A minimum of $1.50 and a requirement of not less than 9 months' use in any year, would take care of this situation with a negligible loss of revenue.

To anyone who anticipates trying out this plan, I would suggest that their rate of return be such that they can afford to service all heaters on a semi-annual schedule without cost to the customer, also, that they service on special calls no charge. If proper heaters are sold and carefully installed, the service costs will not be excessive. Last year we had just 134 such calls on about 300 heaters.

To sum up the virtues of selling gas hot water service by the gallon of water heated, are

FIRST—direct and understandable, therefore easy to sell and keep sold.

SECOND—it provides a nearly perfect service, adequate and continuous supply, perfectly controlled temperature, absolutely carefree operation.

THIRD—the customer may know at any time how much he is using, and what it is costing him.

Because of these facts, the service is worth, and the customer is willing to pay a reasonable premium over and above the cost of indifferent and limited service.

GAS SERVICE STOPS

SINCE 1869 Hays has built dependable brass products for the Gas Industry. Standard, Special Weight, Heavy Pattern and High Pressure Stops to meet all requirements are manufactured by Hays in a full range of sizes. Write for Catalog No. 4 today.

HAYS MANUFACTURING CO. ERIE, PA.

THE GOODMAN STOPPER

The Reliable Shut-Off for Street Mains

Equipped with Improved Patented Locking Sleeve, which locks both handles to the pipe. Stopper cannot slip. Gas cannot pass.

Safety Gas Main Stopper Co.

523 Atlantic Avenue, Brooklyn, New York

To Our Subscribers:

Your Copy of

American Gas Catalog and HANDBOOK

—1936 Edition—now in preparation, will be ready to send you on or about August 1st.

This Reference Manual will far surpass any previous edition. It will include 90 pages or more of data, charts, tables and descriptive editorial matter pertaining to every Department of the Gas Industry,—Manufactured and Natural. Watch for it!

American Gas Journal

Research in Public Relations

(Continued from page 25)

it are free of rubbish, that the buildings are in good repair, that the street names are plainly marked at each intersection, that the lawns are green and well trimmed, and that competent officers are directing traffic smoothly? Study the public relations circle in your company! Within its circumference, important issues are decided.

The various suggestions are arranged under eleven headings:

1. Securing Customer Opinions

1. Have you ever thought of inviting several intelligent persons outside of your company, both men and women, one at a time, perhaps acquaintances of your associates or of their wives, to review your customer-contact procedures to ascertain if they could suggest any improvements? There is nothing unorthodox about this procedure because it is a form of customer-opinion survey. As research is increasing, I suspect that we are going to see more rather than less customer surveys.

2. Do you make any outside check of new customer-contact routines before you install them? If you agree that you might learn something by having an outside check on your existing routines, would not this same principle hold in establishing new routines?

3. Has it ever occurred to you to invite your customers to help you lay out your first-floor office? Perhaps they might have some good ideas as to how they would like to see a gas company store look. Outside viewpoints often suggest things which we overlook because we are so close to our own activities. A prize contest is a possibility here.

4. Does your management encourage the key people in your department to participate in community activities or is this privilege reserved for your company manager or your sales manager, on the assumption that you are inside workers or that you are not as ready conversationalists as they are?

2. Suiting Customer Convenience

5. Could you build good will for your company by providing a lounging spot with a rug, a table, chairs and magazines in a corner of your office where customers might meet each other for shopping or the movies and where they might be tempted to investigate the new gas appliances while waiting?

6. Have you ever thought of installing air-conditioning in your offices so that your customers might be as comfortable as possible while visiting you?

7. Have you studied the advantages of indirect lighting or do you compel customers to look into glaring lights while they are visiting you?

8. Would not your customers appreciate your placing a shelf 9 inches wide along the front of your counters, about 12 inches below the counter level and visible to the cashier, so that they would have bundle space and so that they could move their bundles to one side after they had paid their bills, thus not holding up the people following them?

9. Have you considered that you could improve the ventilation at your counters by having a 3-inch opening running along the bottom of the counters?

10. Did you ever ask people how they like to receive printed return envelopes with monthly bills and did you not find that these envelopes were appreciated, particularly as many bills are sent to our homes and we must often address return envelopes by hand?

11. What would you think of using the return envelope upon which is printed the return postage? Would not this type hasten payments? If your company maintains district collection agencies, the postage cost would be largely offset by smaller agency payments. This suggestion and the previous one would interest those customers who maintained checking accounts.

12. Have you ever thought of installing a special meter in your adjustment department so that customers who claim that their meters don't work correctly or who don't understand how their meters work can see one in operation by looking through a special glass front?

13. What irritates people quicker than being kept waiting on the telephone or being forced to stand in line while customer data is gathered and have you studied record centralization to eliminate these delays? Several companies recently called in some record experts, spent several thousand dollars, and installed a visible, individual, customer, history card containing all essential data. No more are customers delayed while employees reach a decision on granting service or paying bills. This group's public relations director detected the former shortcomings indicating the advantage of having one person to think and act exclusively along public relations lines.

3. Preventing Misunderstandings

14. Might it not prevent misunderstandings between customers and your representatives in compromise debt settlements if you mailed the figures to the customers and asked them to sign them and remail them to you?

15. Might it not be a good idea to send an inquiry to a customer for whom some repair work has been done or a complaint adjusted to ascertain if he has been pleased?

16. Do you provide your meter readers and other employees who visit homes with adequate identification facilities so that they can easily convince the customer that they really are from the gas company and not stick-up men?

4. Credit

17. Do you place a credit rating on each customer's history record card so that, if he were away during the summer you would not send him a "pay or shut off" notice if his rating were first class? A customer's credit rating makes a difference in his treatment by many business concerns. "Pay or shut off" notices do not create exactly the yuletide spirit, and certainly not when customers don't deserve them!

18. Have you ever thought of placing credit ratings in your meter books so that your counter or credit clerks will have a better picture of each customer when handling financial transactions?

19. Why shouldn't the New England gas companies issue credit cards to customers moving from one company's territory to another? This proposal was once discussed in an Accounting Division meeting but few companies have adopted it. This plan would enable your company to build good will for another company and a third company to build good will for your company.

5. Courtesy

20. How many of you are sending a printed welcome card to new customers on the basis that a new customer is just as human as an old customer and that we all like to "mean something" to somebody? Of course, this card is your bow to the new customer and your later dealings must be satisfactory!

21. Are your meter readers willing and glad to explain questions about meters to customers and to show customers how to read meters if they ask?

6. Paying Bills

22. Do all of you have bill adjustment facilities located close to the counter on the first floor?

23. When a customer telephones your company regarding a bill, is he

switched all around the office, finally securing the right person after talking with 3 to 6 wrong persons?

(Note: In connection with the previous 2 thoughts, several companies have so-called turret desks and use what is, in effect, a private PBX board for the adjustment department. This board does not go through the central switchboard and enables people using it to act on a clearing-house basis by securing information from other departments while the inquiring customer holds the wire on the outside).

24. Would not your customers appreciate it if you had a slot in the door of each office, a box on the inside of the door just under the slot and a rack of envelopes on the outside of the door so that they could deposit their payments during the evening?

25. Would it save time for your customers if you were to have a special locked box and envelopes located near your counters so that they could deposit their checks and stubs in these boxes without having to wait in line to pay their bills?

26. Could you not save time for customers paying bills at offices in business or shopping districts who have left their bills at home if your counter employees took, from the ledger record for the duplicate bill, only the name, address, account number, amount owed and date? Several companies have found it unnecessary to copy the full information from the original bill and that this detail elimination keeps customer lines moving faster.

27. Have you men with offices in business or shopping districts studied the lunch hour peaks of your customers so that your counter forces are adequate to handle customers paying their bills then? Many people dread to enter the post office because of the long lines of people so frequently found there!

7. Sending Bills

28. Do you print your several domestic rates on the reverse side of your bills, each rate numbered, and print the rate number of each customer on the front of his bill so that he can easily determine his charges?

29. Would it not be appreciated by customers with prepayment meters if you sent them monthly statements which showed (a) the previous month's consumption, (b) the rate, (c) the previous balance, (d) the amount taken from the meter, and (e) the present balance, on the assumption that this procedure would obviate misunderstandings? As a layman, I would appreciate having such a receipt as a check against the facts as I understood them to be.

30. If a customer's bill carries an overdue notice, would he not appreciate it if that notice were a sticker which could be torn off the bill or if it were a separate notice so that, when he were paying his bill at the counter, other customers would not know that his bill was overdue?

31. Isn't it both desirable and possible to word your overdue notice so courteously that it does not offend and yet so definitely that it secures action? Why not ask a few people to give you their reactions to various wordings so that you can select one which shows a use of the "you viewpoint"? Should we not collect our bills with the least adverse rather than the most adverse effect upon our customers?

8. Being Modern

32. Have you noticed how well the public likes the new type of counters without grilles that are used in some banks and has this suggested that you do what the banks have done?

33. Have you not found that people like uniformed store delivery men rather than delivery men arrayed in any old fashion and has not this observation suggested possibilities for your company?

9. Selecting Contact Employees

34. Do you have a good basis for selecting contact employees and does your analysis really analyze the person's fitness or lack of fitness for handling people effectively? A good personality and intelligence are not the only factors involved!

10. Training Contact Employees

35. Before you place employees in customer contact work, do you rotate them through several pertinent departments so that customers may converse with employees who can handle situations promptly?

36. Would it not facilitate the work of your contact employees (a) if you were to ask them to note every different question relating to policy, procedure or service which customers asked for a period of 30 or 60 days, (b) if you were to take each different question and prepare an answer to it, (c) if you were to mimeograph these questions and answers and supply them to your contact employees, (d) if your employees were to study this material, (e) if they were to supply each month any new questions which were asked during that period, and (f) if you were to prepare answers for these new questions and release them as a monthly supplement? How much better an intelligent explanation to customers than a recitation of rules and regulations! You might also secure some usable ideas as a by-product of this plan.

37. Could you not improve results if you held periodic meetings to discuss contact work, placing before your employees the ideas and experience of other companies? Otherwise, how do you expect them to grow and develop, to attain maximum proficiency? We should study our own particular field and we should know what others are doing in it!

38. Do your meter readers appreciate that wet days mean mud and that their mud inside of a home means that the gas company's name is "mud"?

11. Supervising Contact Employees

39. Do you make periodic surveys of the work being done by each contact employee and of his or her

The *Test* of REPETITION

A STABLE & PROGRESSIVE industry operates on a stable & progressive policy. *"I know of no way of judging the future but by the past,"* said Patrick Henry. In 1936 to date, GPM received orders for over 1,000,000 bushels of iron boring oxide sponge.

Gas Purifying Materials Co., Inc.

L. I. City, N. Y. & Providence, R. I.

GPM IRON HYDROXIDE

temperamental fitness for doing this work well? Even if you originally assigned every contact employee only after studying his qualifications, a periodic check-up remains desirable. If any of your contact employees were assigned without a study of their qualifications, such periodic check-ups are vital. It might conceivably be excellent business to shift an occasional employee to some other type of work!

40. How do you supervise the performance of your contact employees and how do you check the smoothness of their results? Do you ask your friends at bridge some evening or do you check developments at the counters periodically? Or, are you afraid to do too much checking on the theory that what you don't know won't hurt you? Incidentally, that's a very dangerous theory in public relations work!

41. Could you not raise the standard of telephone conversations between your employees and your customers by checking them periodically?

42. If you have an unusual run of complaints or questions, do you do some spot checking at your counters so that you can remedy the situation promptly or do you let a situation get "good and sour" first? One company recently did some spot checking at its counters and this study indicated that the rendering of monthly minimum bills on unread meters should be abolished.

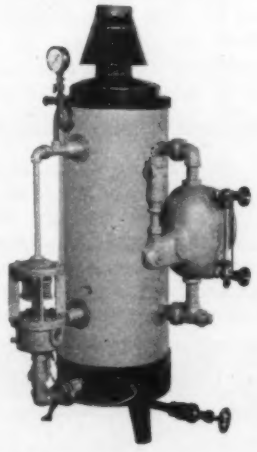
43. Have you studied the fatigue angle of the work of your counter employees by investigating counter heights, the arrangement of material on them, the design of the chairs used, the amount of reaching involved, and similar factors on the assumption that so-called "small" defects dissipate energy—and smiles?

44. Do you permit employees who are not trained in contact work to answer outside telephone inquiries and complaints?

45. Have you ever analyzed the turnover among your contact employees to ascertain the chief causes and have you ever made any systematic effort to obviate these causes from affecting your present staff?

46. How many of you periodically check the correctness of your customers' names and addresses by placing a special sticker on the cashier's stub wherein you request customers to notify you in case of error?

INDUSTRIAL GAS BOILERS
Tubular or Flueless
¾ to 45 H.P.



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Home Service Activities

The annual Convention of the American Home Economics Association was held in Seattle, July 6 to 9. In attendance were teachers of college and high school Home Economics; Demonstration Agents of the U. S. Extension Service; Dietitians; Representatives of the Bureau of Home Economics; Home Service Directors; Directors of Home Economics in Business Concerns and Magazines. At this Convention the American Gas Association and the Pacific Coast Gas Association sponsored a joint exhibit. The A. G. A. Testing Laboratory featured information regarding the A. G. A. Blue Star Seal of Approval—which method of testing has been favorably promoted by many educational groups through the country in their studies on "Consumer Education". The exhibit was under the direction of Mr. James F. Pollard, President of the Seattle Gas Company.

The Theatre Cooking School idea is strikingly carried on among the properties of the Wisconsin Public Service Corporation. For four years these schools have been run one day a week during a month's time as a part of each theatre program. Miss Patterson reports this fourth series as the most successful with a larger attendance than ever before. In Marinette, Wiconsin, the total attendance was about 4500 with a large number of these being an overflow accommodated in an adjoining building receiving the demonstration through a loud speaker. In Stevens Point the three days attracted an attendance of 2500; in DePere the tie-up with the local newspaper for three days had an attendance of 1900.

Kathleen Atkinson of the Providence Gas Company tells of a new type contact. Here it is: "There has been a curious epidemic of church 'sample food fairs' in and around Providence this winter and spring. It started in December when a successful 'fair' was run by a nearby church, and has continued on exactly the same pattern. The church writes to a set list of food houses who send them samples for distribution, along with their literature. The women are charged twenty-five cents each for a collection of these samples and a chance on the door prizes. At nineteen of the fairs given our department has put on one or two demonstrations (depending on whether or not the fair was held afternoon and evening), giving the story of modern gas equipment to three thousand women, to date. All we have had to do is to send out and set up our equipment and give the demonstrations, which is, of course, no small contribution to their fair, but it certainly has been a marvelous series of contacts for us throughout various parts of our territory."

And Helen Diamond of the Minneapolis Gas Light Company says "school contacts have proven interesting; classes from the Miller Vocational High School have been brought to the home service department for demonstrations; a complete oven dinner menu pointing out the saving of fuel and time in this type of cookery was explained. While the meal was in the oven the classes were given a tour through the service building."

At Indianapolis, Marion Schleicher of the Citizens Gas & Coke Utility has cooperated with a City charitable institution for colored women. A six weeks' course, one lesson a week, is conducted evenings, and at the end a certificate is awarded for perfect attendance. Miss Schleicher reports many favorable comments from employers on the worth of these maids after their course in food instruction.

For the Syracuse Lighting Company Margaret Nevins arranged a "style parade," featured as a fifteen minute intermission program during class demonstrations. The style trends of new ranges were featured for one meeting. Through a dealer cooperative plan, twelve different ranges were exhibited, so that all types of construction, operation, appearance, and uses could be featured, playing up the word "style" throughout. A departure in home service contacts with sales, is that in this instance prices were shown on all ranges.

A modern styled, brand new kitchen made an effective background for these new appliances.

At the Texas Centennial this summer there will be several display kitchens which have been planned by Albertine Berry in the Home Service Department of the Lone Star Gas Company. One is in the Hall of Religion, donated by the stockholders of the Lone Star Gas system; three kitchens for the Burrus Milling Company and one in the Southern Pine home.

In the Spanish patio kitchen, the home service headquarters in the San Antonio Public Service Company, Nell Read tells of a new series of home service classes built around the theme of "9 Modern Home Servants". The gas range and the refrigerator,—2 of the 9 modern servants, have alternated as master of ceremonies for the programs. The appliance, enclosed in a cabinet, spoke throughout the program, telling its story of service in the home. A short food demonstration assisted the appliance at intervals to prove the points of efficiency which have been stressed in the talk.

The Mystery Chef Radio Program

Six Months Old and Doing Nicely

By
Charles W. Person

A FEW days ago we completed the first six months of our series of fifteen-minute radio talks by The Mystery Chef. One hundred and four gas and gas and electric companies situated in the territory from Washington, D. C., to Portland, Maine, and from New York City to Buffalo, New York, receive the program over thirteen radio stations. These companies have in active service 5,500,000 domestic meters. In addition, twenty-one companies in the south, middle west and one as far away as Honolulu are using the program by means of electrical transcriptions. These companies have in service 550,000 domestic meters. The total number of companies using the program is 125, with more than 6,000,000 domestic meters, which is forty per cent of all domestic meters in service by the entire gas industry.

The program has consistently sold itself on the basis of the uniformly good results it has produced. It reaches homes during the morning hour when women are occupied with the usual household tasks and it is holding its own against the strong competition of other programs directed to sell the housewife nearly everything under the sun. Some of these morning programs are elaborate, ingenious and costly, and several offer free samples and other gifts to hold the listener's interest. No special lure or offer is injected in The Mystery Chef program. It is a forthright exposition on cookery, the preservation of the many traditions associated with home-prepared meals, and a description of the conveniences, economies and certain results to be obtained from the latest models of gas ranges. The program has not been locally promoted on an extensive basis by any company but has been allowed to stand on its own legs, so to speak, and gather its own momentum unaided. The participating companies, to quote one of them, are primarily interested in this activity because they believe that "something is being said, something is being done, something is being accomplished along the proper educational line to impress modern gas cookery favorably in the minds of home makers."

Because of previous experience on the radio, the last four years of which were highly productive in building up a large public following of women, The Mystery Chef has mastered the technique of appealing both to the hearts and to the heads of his audience. Although his talks are confined in the main to gas cookery they embrace other matters as well. He has discovered that no program wholly devoted to instruction in the art of cookery can hold the attention of an audience of women unless it also plays upon their emotions.

In looking over the advance radio scripts of this program the average gas utility man would doubtless recommend that less should be said about mother love, the sustaining value of a religious faith, the training of children, specific recommendations for a happy married life, etc., and more said about the superior results of modern gas cookery. The mail response from listeners tells a pretty convincing story however. This response is always larger—and so are the requests for the recipe book—following a talk with strong heart appeal. His ability to hold his audience and to gain new listeners is due in no small degree to his gift of delivering a message which has an uplifting effect on women, plus his sincere enthusiasm for tasty and wholesome home cooking—an enthusiasm which rings true over the radio because it is genuine.

An example of the flexibility of radio is the ability of companies using electrical transcriptions to prepare their own commercial announcements for local broadcast use. The recordings we offer for rental are about thirteen minutes in length and cannot be altered, but there is a minute at the opening and a minute at the close where the local gas company can announce its latest appliance selling activities and other developments of community interest.

One of the most effective statements emphasized over and over again by the Chef is that any child ten years of age who uses his recipes and has a strictly modern gas range equipped with all the modern conveniences can immediately, without prior experience at cooking, prepare delicious food products. No statement such as this can be made over and over again on any radio program without having listeners put it to the test. This is exactly what the Chef has wanted his listeners to do and they have done it in large numbers—not only children but women who have never cooked anything before, and those who have wanted to cook but have lacked the determination to tackle it.

To date, more than 700,000 recipe books have been distributed by Regional Advertisers, Inc., sponsors of the program, to participating companies. Perhaps 600,000 of these 700,000 books are actually in the hands of customers. One million books have been printed.

In September of this year the American Gas Association, in behalf of several hundred companies, will launch a cooperative advertising effort of national proportions—the first of its kind ever to be promoted. Magazines of national circulation will be used and local operating companies will tie-in their efforts by newspaper advertising.

The Mystery Chef will, of course, tie-in his radio talks with the national drive. He will refer in detail to the text of the advertisements; will mention the issues and page numbers of the magazines, and will seize every opportunity to create interest in the advertising program by utilizing the many ways offered by radio. At the outset of this national program, therefore, the gas industry will reach an audience of 14,000,000 through magazines, and the Chef's talks will be available to 8,000,000 radio sets, exclusive of automobile sets. The combination of the two—the printed word and picture plus the spoken word over the radio—is ideal, offering, we believe, unlimited opportunities to promote public acceptance of gas as the modern, efficient fuel for all household, industrial and commercial purposes for which heat is required.

A Safeguard on the Vapor Lines

Fulton Duplex Vacuum Regulator

WHEN used in vapor lines connected to storage tanks, for the recovery of gases, the Fulton Duplex Vacuum Regulator will prevent the pulling of a vacuum in the storage tank. When the pressure in the storage tank has been released by removal of gases, the regulator will close. It is so constructed that it cannot do otherwise. Its use affords a very definite safeguard on vapor lines. Write for catalog.

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G-101 Flat Head "Special"
Made—¾" Size only.

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KITSON Quality and Dependability are built into these stops. Made of quality metal, they're sturdy, neat and accurate . . . operate easily and are leak-proof.

KITSON makes Ground Key products in every size, type and pattern for all Gas Company uses.

Send today for literature and prices.

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Kitson Safety Devices (Lovekin Patents) for Domestic Water Heaters	Quality Brass Goods for Gas, Water and All Plumbing Uses

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is the Outstanding Conversion
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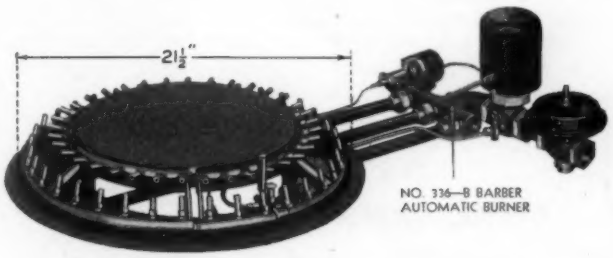

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- Eight different sizes to accommodate round grate diameters from 12" to 34". Also "tailor-made" to SUIT and FIT the grate dimensions of oblong furnaces or boilers.
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We supply Sales Literature, Specification Data Sheets and Practical Sales Assistance. Write at once for latest Illustrated Catalog No. 37 and Revised Price List.

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BARBER *Automatic* JET GAS BURNERS

● for Warm Air Furnaces, Steam and Hot Water Boilers ●
and Numerous Other Heating Appliances

Validity of Gas Franchise

(Continued from page 22)

granted a franchise to lay its pipes in the street. The Transit Commission ordered the gas company to relocate its pipes at this point.

The gas company, realizing that no other company or person could remove or disconnect its gas main with safety, refused to obey the order of the Transit Commission, or to relocate its pipes, unless and until the cost of making the changes was either paid or guaranteed to it.

Suit was filed to settle the question whether the cost of removing this gas main must be borne by the gas company, or whether it is part of the elimination cost to be borne by the taxpayers and the railroad company.

In holding the gas company bound to make the repairs at its own expense, the Court said:

"The gas company has received from the public authorities its franchise or privilege to lay and maintain its gas main under the surface of the public street. Without this grant from the people it has no rights in the highway. This privilege, or franchise, is at all times subject to the police power of the state; in other words, the company maintains its pipes subject to the obligation to remove them whenever the public health or safety require this to be done."

Industrial Temperature Controller

The American Schaeffer & Budenburg Division of Consolidated Ashcroft Hancock Corp., Bridgeport, Conn., have issued catalog 2200 describing the American Precision Temperature Controller. This instrument is designed for use in industries where temperature control of processes is a factor. The feature of this instrument is the bellows, which is a seamless two ply metal made from seamless tubing.

SPRAGUE
CAST IRON GAS METERS
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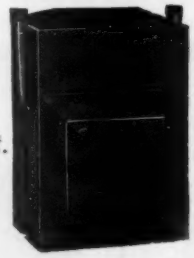
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ALL MAKES — ALL SIZES OF METERS
LARGEST GAS COMPANIES NOW
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LAMBERT METER CO.
BUSH TERM. BLDG. 4, BROOKLYN, N. Y.

News of the Industry

Barber Gas Burner Company Announces a New Series of Burners for Gas Appliances

The Barber Gas Burner Company of Cleveland, O., have just placed on the market a new series of burner units consisting of 36 models adaptable to various gas burning appliances. All are equipped with Safety Pilot Control feature. Various types of jets are included in these different burners, including Impinged, Slotted Cap, Mushroom Cap, and special Ball Cap—all of them covered by Barber patents.

These burners are adaptable to such appliances as: Circulating Heaters, Clothes Dryers, Coffee Roasters, Garage Heaters, Hair Dryers, Floor Furnaces, Space Heaters, Steam Tables, Sterilizers, Warming Ovens, Water Heaters and numerous others.

As an illustration of the adaptability of these new burners, the CU 80 Slotted Cap model illustrated comes in 8, 10, and 12 jet types, in lengths of 10½", 12½", and 14½".

The unusual efficiency, as well as the dependability and safety features of all Barber Burners, both for appliances and for house heating purposes, have long been known to the trade in general. The new models for appliances, brought out at this time, are a further proof of scientific progressiveness on the part of Barber Burner Laboratories.

All of these Barber Burner Units are stocked both at the Cleveland Plant and at the Warehouse of the Barber Gas Burner Company of Michigan, 4475 Cass Avenue, Detroit, Mich. The manufacturer will be glad to send illustrated descriptive literature on request.

"The Science of Re-Humidifying Indoor Air"

This is the title of a new Booklet issued by the Research Department of the Monmouth Products Co., Cleveland, O. In a foreword it is stated that "When the air in a home is warmed it inevitably becomes so dry that it is injurious to the interior of the home, its furnishings, and to the health of its occupants. Modern heating therefore demands means to rehumidify the indoor air."

A large chart showing the moisture content of air at various temperatures, per cent of saturation and average outdoor humidity, in two colors heads the data pages. Several other two color charts are included to illustrate the descriptive data on various humidity control systems.

It contains air leakage tables, data on calculating humidification requirements, outdoor air intakes, evaporation required, evaporation obtainable and evaporation surface required. A copy of Booklet can be secured by addressing the Monmouth Products Co., 217 E. 131st Street, Cleveland, O.

R. J. Rutherford

Rutherford Elected Vice-President Worcester Gas Light Company

R. J. Rutherford, recently elected Vice-president of the Worcester Gas Light Company, a subsidiary of the New England Gas and Electric Association, brings to his new office a wide and diversified experience in the field of public utilities.

Mr. Rutherford was born and raised in Illinois. He graduated from the University of Illinois, specializing in mechanical engineering. His first position was with the Public Service Company of Colorado. From this he went to New York to accept a position of broader scope with the Surface Combustion Corporation. Later he was with the Gas Utilities, Incorporated, of Columbus, Ohio, as assistant to the Vice-president in charge of sales. He left to become Vice-president and General Manager of the Union Gas and Electric Company of Bloomington, Ill.

For the past few years Mr. Rutherford has been assistant to the Vice-president and General Manager of the New England Gas and Electric Association of Cambridge, Massachusetts.

C. R. Lawrence Appointed to Handle Atlanta Appliance Testing and Employee Training

Carl R. Lawrence, American Gas Association Testing Laboratories engineer since early 1931, and for the past year employed in the Publications Department of the Laboratories as Acting Secretary to the Association's various requirements committees, assumed the duties of a new post with the Atlanta Gas Light Company, Atlanta, Georgia, on June 1, 1936.

For the Atlanta company and 30 affiliated nearby utilities, Mr. Lawrence will head up and develop appliance testing operations as well as employee education, both activities now being in formative stages.

Mr. Lawrence's first assignment with the Association's Laboratory in Cleveland was as assistant in its pipe joint research program. This followed five years of sales engineering with the Westinghouse Electric and Manufacturing Company. Later at the Laboratories he participated in industrial gas research, testing, and requirements research work, until in 1935 he was assigned to the Publications Department where he has since been engaged in standardization and committee activities.

F. J. West Honored

Mr. Frederick J. West's many friends will be interested to hear that he was honored with a knighthood by King Edward VIII in his recent birthday honors list. Mr. West is Chairman and Managing Director of West's Gas Improvement Co. Ltd., Manchester, England, and

F. J. West

of West Gas Improvement Company, New York.

It will be remembered that last year Sir Frederick received the Walton Clark Medal of the Franklin Institute of Philadelphia in consideration of his outstanding services to the gas industry. This new honor recognizes not only his services to the gas industry, but also his zeal in municipal affairs and his work in connection with employer-employee relationships and the education of young engineers.

The 1936 Convention and Exhibit

Mr. C. W. Berghorn, Executive Secretary of the Association of Gas Appliance and Equipment Manufacturers announces the appointment of a special committee to plan ways and means to secure the greatest possible attendance of gas men at the convention to be held in Atlantic City, week of October 25th.

The committee expects and hopes to have the cooperation of exhibitors in any or all of the following ways:

First: To supplement the individual membership list of the American Gas Association, we should appreciate having your sales department prepare a list of gas utility men you would like to see at the convention; giving us their names, position and company;

Second: That suitable reference to the exhibition be made in your regular advertising announcing what the gas men may expect to see at your display;

Third: That you request your sales personnel in their daily contacts with gas companies to use their every effort to promote attendance at the convention.

This is the first exhibit of the new Association of Gas Appliance and Equipment Manufacturers in affiliation with the Eighteenth Annual Convention of the American Gas Association.

The following is a list of exhibitors, as of June 23:

A-B Stoves, Inc.
Addressograph-Multigraph Corp.
Air Reduction Sales Co.
Alpha Lux Co.
American Brass Co.
American Cast Iron Pipe Co.
American Gas Association Laboratory
American Gas Journal
American Gas Products Corp.
American Meter Co.
American Stove Co.
American Thermometer Co.

Barber Gas Burner Co.
Bartlett-Hayward Co.
Bastian-Morley Co.
Blodgett Co., G. S.
Bristol Co.
Bryant Heater Co.
Burdett Manufacturing Co.
Burroughs Adding Machine Co.

Caloric Gas Stove Works
Canadian Gas Association
Carson Cadillac Corp.
Chace, Co., W. M.
Chaplin-Fulton Mfg. Co.
Cleveland Gas Meter Co.
Cleveland Heater Co.
Connelly Iron Sponge & Governor Co.
Crane Co.
Cribben & Sexton Co.
Cruse-Kemper Co.
Cutler-Hammer Inc.

Davey Compressor Co., Inc.
Dearborn Chemical Co.
Detroit Lubricator Co.
Detroit-Michigan Stove Co.
Detroit Vapor Stove Co.
Dictograph Products Co.
Dresser Manufacturing Co., S. R.

Eastern Foundry Co.
Economy Governor Co.
Estate Stove Co.

Fisher Governor Co.
Floyd-Wells Co.
Forest City Foundries Co.

Gas Purifying Materials Co.
General Electric Co.
General Gas Light Co.
Glenwood Range Co.
Globe American Corp.

Handley Brown Heater Co.
Hardwick Stove Co.
Harper Wyman Mfg. Co.
Homestead Heater Co.
Hotstream Heater Co.

Inner Tite Clamp Corp.
International Business Machines Corp.
International Nickel Co.

Johns-Manville

Koppers Construction Co.

Lambert Meter Co.
Lattimer Stevens Co.
Lavino, & Co., E. J.
Lovekin Water Heater Co.
Lux Clock Mfg. Co.

Majestic Manufacturing Co.
McWane Cast Iron Pipe Co.
Mercoid Corporation
Merco-Nordstrom Valve Co.
Milwaukee Gas Specialty Co.
Mine Safety Appliances Co.
Minneapolis Honeywell Regulator Co.
Monroe Calculating Machine Co.
Mueller Co.
Mueller Furnace Co., L. J.
Mulcare Engineering Co., Inc.

National Cash Register Co.
National Lock Co.
National Radiator Co.
National Superior Co.
Norge Division—Borg Warner Corp.

Patrol Valve Co.
Peerless Manufacturing Co.
Pennsylvania Furnace & Iron Co.
Perfex Controls Co.
Pittsburgh Coal Co.
Pittsburgh Equitable Meter Co.
Pittsburgh Water Heater Corp.

Radiant Equipment Corp.
Remington-Rand, Inc.
Republic Steel Corp.
Reynolds Gas Regulator Co.
Ridge Tool Co.
Robbins Publishing Co.
Roberts Brass Mfg. Co.
Roberts Gordon Appliance Co.
Roberts & Mander Stove Co.
Robertshaw Thermostat Co.
Roots-Connersville Blower Co.
Roper Corp., Geo. D.
Ruud Manufacturing Co.

Safety Gas Main Stopper Co
Schoenberger Co., W. J.
Semet-Solvay Co.
Servel, Inc.
Skinner Co., M. B.
Smith Mfg. Co., A. P.
Spencer Thermostat Co.
Sprague Meter Co.
Standard Gas Equipment Corp.
Superior Meter Co.
Surface Combustion Corp.

Tappan Stove Co.
Therminsul Corp.
Time-O-Lite Controls Corp.
Tinnerman Stove & Range Co.
Titan Valve & Mfg. Co.

United American Bosch Corp.
United Engineers & Constructors, Inc.
U. S. Pipe & Fourdry Co
United States Steel Corp.
Utilities Publication Committee

Wailes Dove-Hermiston Corp.
Weiskittel Co., Inc., Harry Co.
Welbilt Stove Co.
Welsbach Co.
Western Gas
Whitehead Metal Products Co.
Wilcolator Co.
Wood Co., R. D.
Wood Manufacturing Co., John

Youngstown Sheet & Tube Co.

House-Heating Sales Manager

Robert M. Sayre has been appointed sales manager of the House-Heating Department of The Laclede Gas Light Co.

Mr. Sayre comes to Laclede from the Kansas City Gas Co. where he was employed for 10 years in an engineering and sales capacity, and succeeds W. R. Lacey, who resigned to accept a position with the Bryant Heater Co. of Cleveland, Ohio.

Coming Events

July

8-10 Canadian Gas Association, 29th annual convention, and Northwest Conference, Pacific Coast Gas Association, Hotel Vancouver, Vancouver, B. C. George W. Allen, secy.-treas., Canadian Gas Association, 21 Astley Ave., Toronto, Canada.

August

25-27 Pacific Coast Gas Association, 43rd annual convention, Fairmont Hotel, San Francisco, Calif. Clifford Johnstone, managing director, 447 Sutter Street, San Francisco.

October

Week of October 25 American Gas Association, 18th annual convention, Atlantic City, N. J. Alexander Forward, managing director, 420 Lexington Ave., New York, N. Y.

October 25-30, Inclusive. Exhibition of Gas Appliances and Equipment at the First Annual Convention Association of Gas Appliance and Equipment Manufacturers in Affiliation with the Eighteenth Annual Convention of the American Gas Association, Atlantic City Auditorium, Atlantic City, N. J.

HEATING BUNKER "C" OIL

for carburetting gas requires high pressure and high temperature.

ANDALE BOWED TUBE HEATERS

remain tight and are easily cleaned. These are the requirements for continuous satisfactory operation.

ANDALE COMPANY

1600 ARCH STREET

PHILADELPHIA

JOHNSON

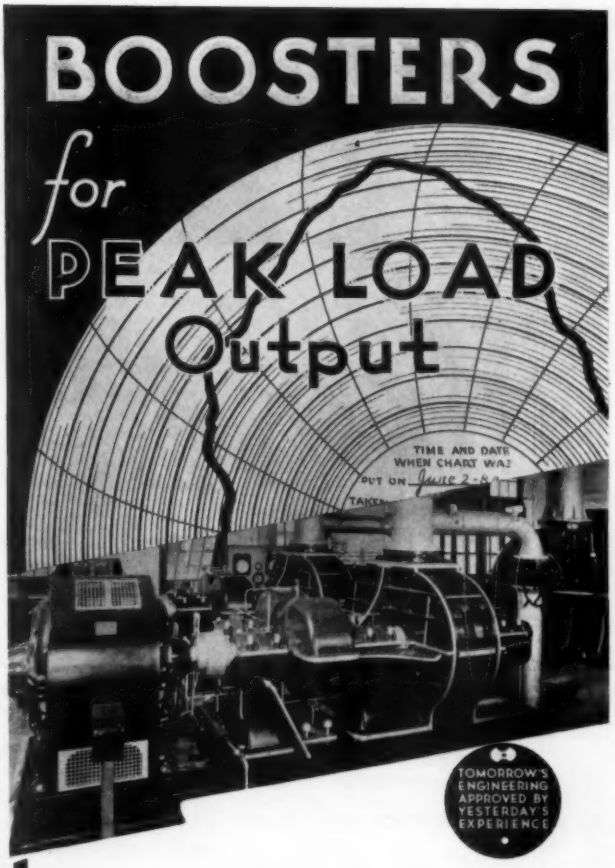
NO. 118 COMBINATION BENCH FURNACE

A convenient, efficient and economical bench furnace for shop or factory use. Combination design permits heating large soldering coppers—heat treating metals—tempering tools—soft metal melting, etc. Refractory-lined, curved-top fire-box and intense controlled heat from three powerful Johnson Burners insure uniform temperatures and quick heat without forced air blast. Write for free descriptive catalog.

JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA

Western Representative:
C. B. BABCOCK CO.
135 Bluxome Street
San Francisco, Calif.

Eastern Representative:
J. H. McPHERSON
250 Stuart Street
Boston, Mass.



The many users who rely on "R-C" Boosters for maintaining line pressures during periods of peak demand, know that they can depend upon this same type of equipment for prompt action in times of emergency. Their long experience with "R-C" Boosters in regular use explains the wide spread choice of similar equipment for standby service. Write for bulletin.

Roots
CONNERSVILLE
BLOWER CORP.
CONNERSVILLE, INDIANA

New Design for Round Case Indicating Flowmeters

American Meter Company, New York, has just announced a new indicating flowmeter case of advanced design, simplicity and attractive appearance.

This type of installation is to indicate the rate of flow of air, gas, oil, steam or water through a line in which an ori-

fice is installed. It consists of a modified U gage in which mercury is used as a liquid seal, and a sturdy case to enclose the pointer and dial.

A steel float which rests in the mercury in one of the columns is raised by the rise of the mercury. The float is attached by a lever to a horizontal bearing shaft which extends through an adjustable lapped stainless steel stuffing box into the case.

The differential ranges are: 0 to 100; 0 to 50; 0 to 20, and 0 to 10 inches of water, as specified by the customer. Special ranges are available.

Two types of cases can be obtained; the round dial and the segmental dial, as illustrated.

Complete engineering data and specifications may be obtained from American Meter Company's general office at 60 East 42nd Street, New York, N. Y. or from any of the company's factories or sales offices.

Penna. Gas Association Committee Chairmen for 1936-1937

H. N. Squier, president of the Pennsylvania Gas Association, has named the chairmen of the various committees for 1936-1937. These were approved at a meeting of the Council of the Association held at Hershey, Pa., on June 18:

Accounting—E. N. Keller, Philadelphia Electric Company

Distribution—H. B. Anderson, The Philadelphia Gas Works Company

Entertainment—M. N. Bailey, Philadelphia

Finance—R. G. Rincliffe, Philadelphia Electric Company

Highway and Bridges—Geo. B. Bains, 3rd, Harrisburg Gas Co.

Industry and Welfare—H. H. Ganser, Philadelphia Electric Co.

Membership—M. A. Boylan, Scranton-Spring Brook Water Service Co.

New Business—H. S. Christman, The Phila. Gas Works Company

Papers and Program—Allyn C. Taylor, Consumers Gas Co., Reading

Production—P. T. Dashiell, The Phila. Gas Works Company

Publicity and Advertising—Wm. H. Evans, Phila. Electric Co.

Tax—F. W. Lesley, Pennsylvania Gas & Electric Company

Time and Place—E. G. Boyer, Philadelphia Electric Company

The following were named by President Squier to serve on the A. G. A. Committees:

Accounting—E. N. Keller, Philadelphia Electric Company

Manufacturing—C. E. Bartlett, Philadelphia

Commercial—H. S. Christman, The Phila. Gas Works Co.

Advertising—Wm. H. Evans, Phila. Electric Company

Industrial—F. H. Trembly, Jr., The Phila. Gas Works Co.

Technical—L. B. Eichengreen, Phila. Electric Company

Taylor Fulscope Indicating Controllers for Temperature and Pressure

For the many processes where close throttling control is imperative but a record of the processing is not essential, the Taylor Instrument Companies, Rochester, N. Y., have just put on the market a moderately priced, highly adaptable, air-operated controller of the indicating type.

The outstanding features are as follows:

Either high-range or full-range sensitivity, as required. The former for processes having small time lags; the latter for time lags of any magnitude. Both are fully adjustable by turning a graduated dial.

The control point may be adjusted to any value within the control range. Direct-set feature is optional.

Controller action may be quickly reversed in the field by altering the position of a link.

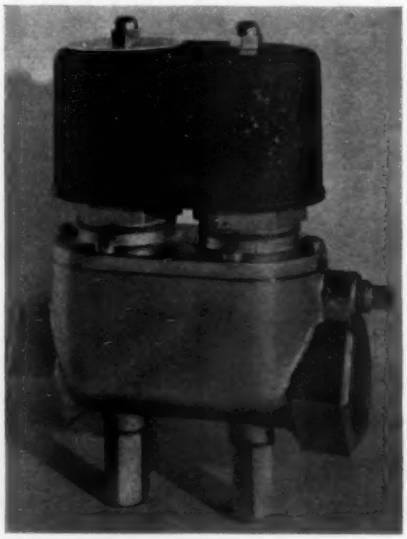
Many standard control ranges to choose from within the limits of minus 100 and plus 1200 F., or full vacuum and 3000 lbs. pressure. Control ranges are interchangeable.

The large scale with bold numerals and graduations enable the operator to make accurate observations from a distance.

Write for Catalog 86R.

New Solenoid Gas Valve

The development of a new type of solenoid gas valve for domestic furnaces is announced by the General Controls Co., Cleveland, Ohio. Hi-low-off control of gas flow is obtained with this new dual valve, the trade name of which is the GENERAL D-40. The D-40 automatically changes from low to high and back to low firing positions at the demand of a room thermostat. A steady flow of furnace heat is obtained at low firing with longer "on" periods and shorter "off" periods.



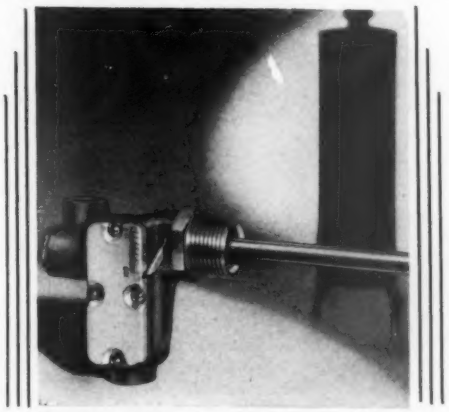
The evil of overheated rooms caused by continued radiation after plant shut-down due to overheated plants is eliminated. Standby losses due to furnaces becoming cold during prolonged "off" periods are decreased. In this way, steadier room temperatures are maintained and material fuel economies are effected, according to the manufacturers.

The GENERAL D-40 is fully automatic, closing the gas flow in case of current failure. It also has the advantage of being easily adapted to existing equipment such as time clocks and limit controls, and allows for future addition of equipment such as automatic pilots.

The GENERAL D-40 is packless in construction, requires no oiling or care of internal parts, and will not stick. Closing with the pressure on top of the seat insures a tight shut-off. Low firing is adjustable. All parts easily accessible. Solenoids are separable. Manual bypass incorporated to open main valve in case of prolonged current failure. Standard equipment for 24 v circuit only.

Roper's Eastern Sales Manager Establishes New Offices

W. J. "Bill" Foster, Eastern Sales Manager of the Geo. D. Roper Corporation, Rockford, Illinois, has recently moved into larger offices at 705 Liberty Trust Building, Philadelphia, Pa. Offices were formerly at 141 North 15th Street.



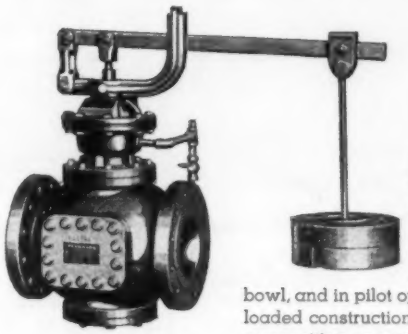
Titan Snap Action Thermostats deserve your complete confidence. Their reliability has been proven by years of hard service under all conditions with all types of gas. TITAN controls are attractive, sensitive, rugged, trouble-free, service-proof. They are used on most automatic storage heaters approved by the American Gas Association.

Catalog and full data upon request.

The Titan Valve & Manufacturing Company
Thermostats • Safety Pilots • Relief Valves
3205 Perkins Avenue Cleveland, Ohio

TITAN WATER HEATER CONTROLS

WIDER RANGE



Reynolds High Pressure Line Regulator . . . without auxiliary bowl. . . . Available with bowl, and in pilot operated or pilot loaded construction with choice of composition or metal seats.

★ **REYNOLDS New High Pressure Line Regulator without auxiliary bowl, features a wider range of delivery control pressure.**

For outlet pressure, from 2 to 100 pounds in the line, this unit assures absolute accuracy . . . dependable control. Variance in outlet pressure is made possible by use of four different sizes of diaphragm cases.

On inlet pressure, range is up to 650 lbs. Regulator furnished in cast iron, steel or bronze body, depending upon pressure requirements.

Write for details.

REYNOLDS PRODUCTS

High Pressure Service House Regulators — Straight Lever Type — Models 0-10-20 series; Toggle Lever Type—Model 30 series.

Low Pressure Service or Appliance Regulators.

District Station Regulators, Single or Double Valve—Auxiliary Bowl and Automatic Loading Device Optional.

High Pressure Line Regulators—Pilot Loaded—Pilot Controlled.

Toggle Type Regulators—Single Valve, Double Valve, Triple Outlet.

Seals—Dead Weight or Mercury. Back Pressure Valves . Automatic Quick Closing Anti-Vacuum Valves . Automatic Shut Off Valves . Lever Operated Valves . Louver Operated Device . Atmospheric Regulators . Vacuum Regulators.

★

Branch Offices:

421 Dwight Building
Kansas City, Mo.

2nd Unit,
Santa Fe Bldg.
Dallas, Texas

Representatives:

Eastern Appliance Co.
Boston, Mass.

F. E. Newberry,
Avon, N. J.

★

REYNOLDS GAS REGULATOR CO.
ANDERSON, INDIANA, U. S. A.

GAS CONTROL SINCE 1892

CHACE BIMETAL *used Exclusively* IN HUMPHREY GAS UNIT HEATERS

The new Micro-switch safety pilot control of Humphrey Gas Unit Heater breaks the motor circuit and shuts off the gas automatically in event of pilot failure. For the past seven years, Chace Thermostatic Bimetal has been used exclusively as the active element in Humphrey pilot controls. Where automatic action or control of temperature is desired, investigate Chace Thermostatic Bimetal.

CHACE THERMOSTATIC BIMETAL
"It Bends with the Heat"

W. M. CHACE CO.
1610 Beard Avenue - - - Detroit Mich.

Enlarges Minneapolis-Honeywell Plant

The picture is of the newly enlarged Minneapolis-Honeywell Regulator Company plant and Main Office at Minneapolis. The wing extending away from the street on the left of the picture is a newly completed addition which provides nearly 50% more floor space than has been available. Note on the top of the new wing an experimental bungalow. This is a frame structure built to the usual specifications for dwellings in that territory, insulated in the normal manner and with the usual construction used throughout. There provision has been made for heating, either by Warm Air, Steam, or Hot Water, and it is equipped with the necessary duct work for air conditioning.

Directly beneath the house is the Test Department of the Engineering Division in which are located boiler, furnace, and air conditioning equipment by means of which any desired method of heating or air conditioning may be applied to this house for experimental purposes and research.

As a further addition to the Company's research facilities, as well as for the comfort and efficiency of office employees, three complete air conditioning installations have been made to provide air conditioning for the offices and Engineering Department on the entire sixth floor, and a portion of the fifth floor.

Obituary

COL. E. S. DICKEY

Word has been received of the sudden passing of Mr. E. S. Dickey, in Baltimore on June 20th. Col. Dickey was born April 18, 1873, entering the meter business in 1889 as an apprentice with Dickey, Tansley & Company. This concern operated Maryland Meter Works which became part of American Meter Company in 1876. Between the years 1891 to 1896, Col. Dickey served with the Pennsylvania Railroad, and The Metropolitan Life Insurance Co., returning to the Maryland Meter Works in 1896, where he was appointed Works Manager in 1899, General Manager in 1911 and Executive Representative of American Meter Company in 1935. During his activities as Works Manager, Col. Dickey, developed in cooperation with gas company engineers and his own associates, the B-Type meter with increased capacity, conservative slow speed, improved construction as compared to the 5-Light size manufactured in 1906. The development of the B-Type meter was continued in subsequent years to include all of the larger sizes in this type as now manufactured. In 1916 to 1917 in collaboration with the late George A. Lane, Superintendent of Meters, Peoples Gas Light & Coke Company, Chicago, he developed the double-diaphragm, large capacity meters now manufactured and known as the C Type Meters.

GEORGE HOBBS

Death due to accident came on June 18th to George Hobbs, manager of the Toronto, Ontario factory of the Ruud Manufacturing Company, and a Canadian pioneer in the manufacture and sale of automatic gas water heaters.

Mr. Hobbs was born in London, England, in 1871 and emigrated to America with parents at an early age. After living on a farm for a short period, he entered the plumbing trade, later visiting the United States and working for the Pullman Company between New York City and Jacksonville, Fla.

Later, he was in the plumbing business in Dayton, Ohio, and Columbus, Ohio, at which latter city, he was associated with Samuel Esswein.

Joining the Ruud Manufacturing Company in the spring of 1907, he returned to Canada, where he established a selling organization for Ruud Automatic Gas Water Heaters and later the factory which he managed successfully until his untimely death.

He was an outstanding leader in the development of the popularity of automatic gas water heating in Canada, and respected by all who knew him.

AUGUSTUS J. PENOTE

Augustus J. Penote, 55, President and founder of The Cleveland Trencher Company and The A. J. Penote Company, died May 9th at his home in Cleveland, Ohio, of an acute heart attack.

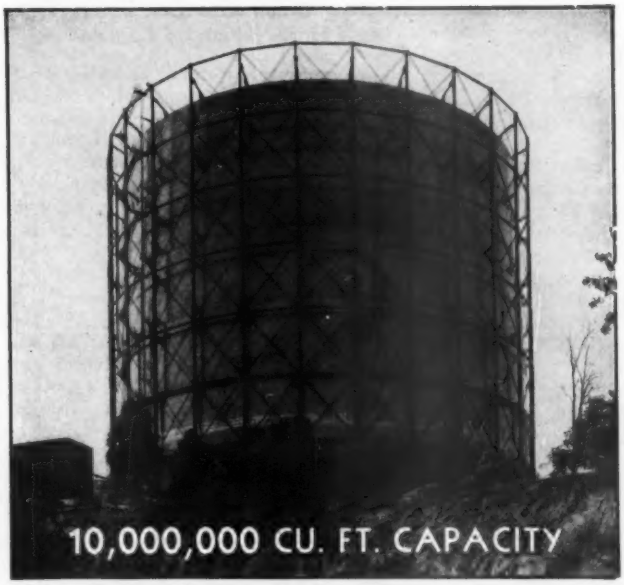
Mr. Penote was born in Buffalo, New York, but had resided in Cleveland for the past thirty-eight years.

He was nationally known throughout the Public Utility Field as a contractor, manufacturer and inventor. Among his many inventions was the Full-crawler-type trenching machine, of compact design for city work, which he constructed originally for his own use; subsequently founding the Cleveland Trencher Company for its manufacture.

Universally respected and loved by business associates and employees, Mr. Penote was proud of the part his work and inventions have played in the expansion of Utility Service.

HORACE PAUL SCOTT

Funeral services were held recently for Horace Paul Scott, 41, assistant secretary-treasurer of the Memphis Natural Gas Co., who had been with that organization since it started in 1928.



HIGH PRESSURE **GAS HOLDERS** LOW PRESSURE

PURIFIERS · TANKS · CONDENSERS
STEEL PLATE CONSTRUCTION

INTEGRITY GOOD WORKMANSHIP FAIR DEALING

CRUSE-KEMPER CO.
AMBLER, PA.

TECHNICAL CECO PAINTS

GAS HOLDER and PLANT PAINTS

CECO Paints have behind them the solid experience of more than 50 years specializing on paints for gas companies, reinforced by latest technical research and refinements.

Your inquiry will have *expert attention by men who know the gas man's paint problems.*

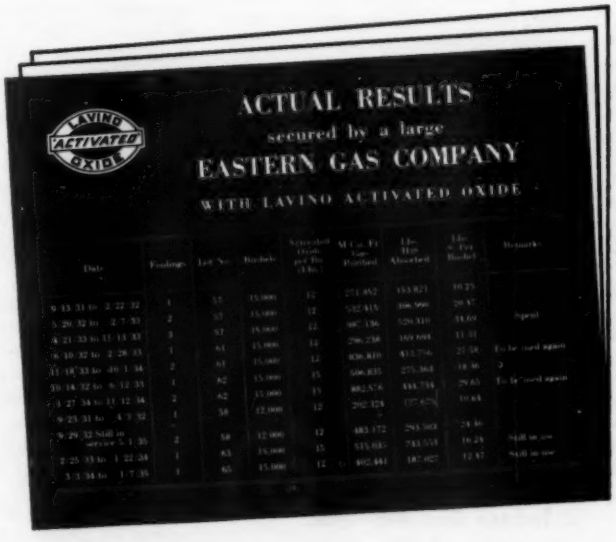
CHEESMAN-ELLIOT CO., INC.

Technical Paint Makers—Established 1876
647 Kent Ave. Brooklyn, N. Y.

DIRECT MAIL RETURNS INCREASED!

NEW, Patented, Advertising Blotter has Business Reply Card BUILT-IN! Blotter never discarded, lives indefinitely. Prospects send back reply cards immediately or weeks later. Mails for 1¢. Greatest direct mail buy on the market. Write for FREE SAMPLES today, please mention your printer.

REPLY-O-BLOTTERS
225 VARICK STREET, NEW YORK, N. Y.



HERE'S *PROVEN* PERFORMANCE!

Let us give you the details of the demonstrated convenience and economy of Lavino "Activated Oxide" . . . made *specifically* for maximum H_2S removal. Write today, there is no obligation. Also available in ready mixed form, for those who desire it.

E. J. LAVINO and COMPANY

1528 Walnut St., Philadelphia, Pa.

Chicago Pittsburgh

The New England Summer Sales Conference

Once more the New England Gas Association has rendered a notable service, and the members of the industry have again shown their appreciation of it.

The New England Summer Sales Conference was held at the New Ocean House, Swampscott, Mass., on June 18th and 19th. The registration of 220 exceeded by about fifty per cent the most optimistic estimates, and was actually greater than that at New London last year when a combined conference of the New York and New England groups was held.

Advertising, selling, home service and rates were the subjects covered in a series of concise papers. They dealt directly and specifically with many of the questions most actively before the gas industry today. Several of these papers appear elsewhere in this issue of the *Journal*.

In opening the Conference, Chairman John J. Quinn said: "Some years ago, and for several years, these comments (of the Chairman) had to a large extent to do with regional cooperative gas advertising. At other and more recent times such remarks seemed to be directed particularly to the newer competitive position of our New England industry. Tonight we are to hear discussions presented on the national advertising program of our industry, upon which we have so recently embarked. Of competition, we will no doubt hear much before these sessions conclude, for like the poor, the competition will do doubt always be with us. Like also, the troublesome and irritating fleas on the dog this competition of which we so frequently seem to despair, is not a wholly incurable difficulty.

"It is acknowledged that the outstanding problem in all business today is the problem of sales. Upon the maintenance of an adequate sales volume rests the progress and prosperity of any enterprise. The product offered must be sold at a price that is attractive to the customer, yet sufficient to meet production and marketing costs plus a profit. Without meeting these required conditions, no business venture can be permanently successful. Our gas business is no exception. As never before the cry is sales—adequate volume at prices that the public will pay. No easy proposition to be sure, but one that I believe can be and will be solved."

Indiana Gas Men Meet

A successful spring convention was held by the Indiana Gas Association at Purdue University, May 20 and 21, with more than 200 delegates in attendance.

Headed by C. V. Sorenson, general sales manager of the Public Service Co. of Indiana, the committee outlined a 12-month advertising program in key newspapers which will blanket the state of Indiana.

The program included a discussion on "Unaccounted-for Gas," headed by Guy M. Johnson, general gas superintendent of the Northern Indiana Public Service Co.; a paper on "Evansville's Experience Since the Introduction of Natural Gas," by C. K. Graham, commercial manager of the Southern Indiana Gas and Electric Co.; a paper on "Recapturing the Gas Revenue," by A. V. Grief, vice-president of the Gary Heat, Light and Water Co., and an address on "Selling Gas Refrigeration," by B. H. Gardner, director of sales of the Columbia Gas and Electric Corp.

L. C. Heavner, of the Fort Wayne office of the Northern Indiana Public Service Corp., was elevated to the presidency of the association, succeeding R. N. Zeek, of the Michigan City office of the company. Mr. Heavner served as vice-president last year.

H. C. Wolfe of the Central Indiana Gas Co., Muncie, was elected vice-president and P. A. McLeod, division manager of the Public Service Co. of Indiana at New Castle, was re-elected secretary-treasurer.

Appalachian Coals, Inc., Resume Operations

Again making use of the legal formula approved by the Supreme Court of the United States, Appalachian Coals, Inc., pioneer regional sales agency, Cincinnati, O., has resumed marketing coals from the high volatile fields of Kentucky, Tennessee, Virginia and West Virginia.

After the highest court in the land invalidated the Guffey Act, which court had given a bill of rights to the Appalachian plan in 1933, the Cincinnati agency reported that "sufficient tonnage is represented by signed contracts to justify the corporation resuming active operation as of June 1, 1936." No official announcement has been made concerning the total tonnage of companies now affiliated with the agency, but it is believed that approximately 70,000,000 tons of the 85,000,000-ton capacity, formerly under contract, are represented under the new marketing agreement.

Recent action of the Appalachian board of directors appointed R. E. Howe, formerly secretary-treasurer, as vice president and treasurer. T. A. Day, formerly manager of the advertising and publications department, has been made assistant secretary. He will continue to direct advertising and sales promotion.

Appalachian Coals, Inc., is credited with having had an important stabilizing influence throughout the Southern coal fields before, during and after NRA. From March, 1933, until April, 1935, the Cincinnati agency provided market information for nearly 150 coal producing companies which operated 250 mines, having an annual capacity of 85,000,000 tons, in the four principal mining states of the South.

In addition to this marketing service, Appalachian Coals, Inc., carried on advertising, coal analysis, credit service, dealer cooperation, fuel engineering, market research, merchandising, mine inspection, publicity, sales promotion, statistical service, and traffic management for its affiliated operators. Some of these activities have been resumed; others may be undertaken in the near future.

Brooklyn Union Gas Co. Offers Five Year Finance Plan on Appliances

The first five year retail financing plan for a complete line of household appliances in the Metropolitan New York area has been introduced by The Brooklyn Union Gas Company. The plan covers all fully automatic gas ranges, refrigerators, water heaters and house heating boilers sold by the company or its cooperating dealers in Brooklyn and Queens. The five year payment plan applies whether one or more appliances are purchased.

The purpose of the plan, according to Assistant Vice President Hugh H. Cuthrell, is to enable householders in this company's territory to enjoy the benefits of fully automatic household service without the burden of large monthly payments. Together with the low gas rates instituted last December the new plan aids Brooklyn and Queens residents to possess automatic cooking, refrigeration, water heating and house heating at a cost well within the range of the average family.

"Our decision to extend time payments over such a long period results from our experience with residents of Brooklyn and Queens," according to Mr. Cuthrell. "We have found that many people are anxious to avail themselves of the benefits of modern automatic gas service. Some of them have refrained from installing a gas water heater and gas house heating equipment because of the monthly payments required for short time financing.

"In response now to the appeals of customers, 'if only I had a longer time to pay,' we are extending deferred payments over five years. Through this plan residents of Brooklyn and Queens can have modern automatic gas service in their homes at a small monthly cost."

An indication of what the five year financing plan means for customers is given in the fact that a customer may purchase an automatic gas range, refrigerator, water heater and house heater for as little as $2.58 a week. On the average the gas bill for all four domestic appliances would be about $4.36 a week.

The following table shows the weekly amounts for which various appliances can be purchased, the average weekly gas cost and the total weekly cost for the first five years:

	Cost		Gas Bill		Total
Range	$ .39	+	$ .49	=	$ .88
Refrigerator	.65	+	.36	=	1.01
Water Heater	.42	+	.57	=	.99
House Heater	1.12	+	2.94*	=	4.06
Totals	$2.58	+	$4.36	=	$6.94

* This is based on using 350,000 cubic feet per year for house heating. This average includes a number of large homes as well as some small ones. In this company's territory there are many homes averaging 200,000 cubic feet of gas per year for house heating. If 200,000 cubic feet were used, the gas bill would be reduced more than 40 per cent from the figure given above.

While customers may enjoy these services for $6.94 per week during the first five years, the cost will be less after five years. Then the appliances will have been fully paid for and the cost of fully automatic gas service for cooking, refrigeration, water heating and house heating will average only $4.36 per week.

JOURNAL

Gas Flow Computers

High or Low Pressure

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Length of Pipe—Feet 30-30,000
Specific Gravity 1.5-.35
Constants 1400-1000

High Pressure Computer Range:

Cu. Ft. of Gas Per Hour—100-10,000 M
Diameter of Pipe Inches ¾-30
Difference in Absolute Pressure—Lbs. per sq. in. 1-500
Sum of Absolute Pressures—Lbs. per sq. in. 2000-20
Specific Gravity 1.5-.35
Length of Pipe—Feet 100-5000
Length of Pipe—Miles 1-250

PRICE $3.50 Each

SIZE 6½" x 8"

AMERICAN GAS JOURNAL

53 Park Place **New York**

Bank Brings Suit to Protect Bond Holders of Indianapolis Gas Co.

The Chase National Bank of New York has filed a suit in Federal Court as trustee and in behalf of holders of bonds of the Indianapolis Gas Company against the city of Indianapolis, as successor to the Citizens Gas Company, the Indianapolis Gas Company and the members of the boards of trustees and directors for utilities of the city.

The bank is the trustee holding the property mortgaged by the Indianapolis Gas Company to secure their bonds which are now outstanding in the amount of $6,881.00.

The complaint seeks a declaratory judgment from the court that the ninety-nine year lease executed Sept. 30, 1913, by the Citizens Gas Company and the Indianapolis Gas Company is part of the property covered by the mortgage to secure the payment of the bonds of the Indianapolis Gas Company, which the trustee says are now owned by numerous and widely-scattered individuals and institutions, and seeks to prevent the loss or damage to this security by any acts of the city, and the Indianapolis Gas Company and the other defendants named in the complaint.

The complaint sets forth that under the ninety-nine-year lease from the Indianapolis Gas Company to the Citizens Gas Company of Indianapolis, the lessee was required to pay to the trustee of the Indianapolis Gas Company bonds, the interest as it should from time to time mature. At the time the city took over the property of the Citizens Gas Company, it declined to recognize the ninety-nine-year lease from the Indianapolis Gas Company.

At the present time the city is operating the plant and system of the Indianapolis Gas Company under a temporary arrangement whereby the amount of the stipulated rentals under the lease is from time to time paid to the Indiana National Bank to be held by it pending a final agreement respecting the leased property, or pending a judicial determination of the questions in controversy between the city and the Indianapolis Gas Company.

The complaint contends that these arrangements were made without the knowledge or consent of the trustee or the bondholders of the Indianapolis Gas Company and that the bondholders are entitled, under provisions of the lease, to receive from the city of Indianapolis the interest on the outstanding bonds as it accrues.

New Orifice Fitting Announced

A new orifice fitting known as "Type E," for handling gases and liquids is announced by Robinson Orifice Fitting Co., of Los Angeles. The main operating mechanism, which is entirely enclosed in the upper chamber, consists of a heavy stationary screw and a follower nut, pivoted to the orifice plate carrier. This simple device raises or lowers the orifice plate carrier and forces the carrier into its position in the lower seats. When the plates are to be inspected or changed, the carrier is lifted completely out of the upper chamber and is held in a convenient position for servicing.

The valve seats are covered in both open and closed positions. A full-floating plug valve is lubricated with an equalized pressure system. It is never necessary to lift the carrier manually because it is supported at all times. The orifice fitting has a quick change cover plate. Positive control of the orifice plate is maintained under all pressures. An indicator definitely shows the operator when the orifice plate is positioned in the pipe line bore. The orifice plate may be locked in place, preventing unauthorized changing of orifice plate setting.

Modernizing Sales Floor

Students of modern merchandising methods say that one factor that builds up store sales for the Utility more than any other is modern store lay-out and fixture design. Several operating companies have standardized their store equipment to the extent that they are able to modernize their stores in the large city or the hamlet at a cost that is no higher than the old scheme of "fixing-up the place a bit." These companies have made a very careful study of fixture units, display cases, cashier's windows, wrapping counters and service desks with the view of bringing their merchandise to the attention of everyone entering the store. These scientific layouts result in a quicker turn-over and bring more and more people into the stores, saying nothing of increasing the amount of business handled without an increase in sales force. Gas appliance merchandisers will do well to consider a planned store lay-out if store sales are not all that they should be. Women especially like to shop in an atmosphere that is colorful, restful, modern in appointments and arrangement.

Trained For the Job

Men and women don't become doctors by chance. They spend years of their lives getting the necessary knowledge. And then, only after passing examination after examination, are they allowed to prescribe for mankind's physical ailments.

To construct bridges you must be an engineer with considerable experience at erecting bridges that won't collapse. Scientific advance is not achieved by novices playing with test tubes. In private business, the man at the top works himself there. He, too, has spent years studying for his job.

The average politician, on the other hand, is just a man elected to office. No special knowledge is required of him.

In the magazine, Annals of the American Academy, Matthew Woll, a vice-president of the American Federation of Labor, commented on this as follows:

"Corporations are controlled by men. The machinery out of which corporations make their products and profits is controlled by men. One of the great issues of the future is going to revolve around this question: Which set of men shall exercise the judgment upon which control and regulatory measures shall be based? Shall it be the political or industrial set that will govern the operation of industry? Labor holds that the competence lies within industry and that politics and political methods may possess such competence only by chance."

We wouldn't let a politician remove our appendix or treat our heart. Why let them run the business of this country?

Reprint from Home Service News, Moline, Ill.

INDEX TO ADVERTISERS

Alpha Lux Co.	40	Kitson Co.	39
American Gas Journal Computers	49	Lambert Meter Co.	40
American Gas Products Corp.	—	Lattner Mfg. Co., P. M.	37
American Meter Co.	—	Lavino & Co., E. J.	47
American Stove Co.	—	McWane Cast Iron Pipe Co.	4
Andale Company	43	Minneapolis-Honeywell Regulator Co.	Back Cover
Barber Gas Burner Co., The	39	Merco Nordstrom Valve Co.	19-20
Bartlett Hayward Co.	3	Mohawk Asphalt Heater Co.	—
Cast Iron Pipe Research Ass'n	2	National Tube Co.	3
Chace Co., W. M.	45	Phillips, Alfred I.	40
Chaplin-Fulton Mfg. Co.	39	Pittsburgh Coal Co.	—
Cheesman-Elliot Co., Inc.	47	Pittsburgh Equitable Meter Co.	Front Cover
Combustion Utilities Corp.	51	Reply O. Inc.	47
Connelly Iron Sponge & Governor Co.	51	Reynolds Gas Regulator Co.	45
Cooper-Bessemer Corp., The	—	Robertshaw Thermostat Co.	—
Cruse Kemper Co.	47	Roots-Connersville Blower Corp.	43
Dresser Mfg. Co., S. R.	—	Ruud Manufacturing Co.	—
Electrolux Refrigerator Sales Inc.	—	Safety Gas Main Stopper Co.	33
Gas Purifying Materials Co.	36	Semet Solvay Engineering Corp.	—
Handley Brown Heater Co.	—	Skinner Co., M. B.	6
Hays Mfg. Co.	33	Sprague Meter Co.	40
Improved Equipment-Russell Engr. Div.	51	Stacey Bros. Gas Construction Co.	—
Isbell-Porter Co.	51	Superior Meter Co.	4
Johnson Gas Appliance Co.	43	Titan Valve & Mfg. Co., The	45
		United Engineers and Constructors Inc.	—
		U. S. Steel Corp.	3
		West Gas Improvement Co.	—

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IRON Connelly Iron Sponge and Governor Co. SPONGE
Elizabeth, N.J.
Chicago

1876 [USE THE BENEFIT of 60 YEARS EXPERIENCE] 1936

Pipe Corrosion and Coatings

(Continued from page 9)

nomic and partially controllable loss of electrical energy rather than as a potential source of damage to pipe lines. As a result foreign systems which convey or use electricity were designed to minimize stray currents. Legislative recognition of the problem occurred earlier in foreign countries and laws were more rigidly enforced than in the United States. An act of Congress instigated the investigation of the effect of stray current electrolysis in 1911. The United States Bureau of Standards by 1913 had sufficient proof of the considerable damage occurring on sub-surface structures from electrolysis to recommend additional intensive studies. By 1918 the investigations revealed that maintaining a buried structure at a lower electrical potential than the surrounding soil was a means of minimizing the effect of electrolysis and the process was termed "Cathodic Protection." This term occurred in a number of patent applications.

In the past ten years there have been a number of developments such as use of porcelain enamels and cement for coatings both of which have many advantages but are difficult or costly to apply. That corrosion mitigation by means of cement coatings is not a new development is indicated by the French Academy's investigation of internal corrosion in 1936 which led to a report and the recommendation of cement lined water pipe. The first use of cement lined pipe in the United States occurred on a water line in 1870.

A review of the history of pipe coatings is valuable in providing information essential to clarify the common attitude that the protection of sub-surface pipe lines is a comparatively recent subject and that experience is lacking. There is a tremendous volume of written matter on this subject, a thorough study of which forcibly indicates the necessity for thorough recording of the methods used in protecting a pipe line, the periodic inspection of the material and pipe, more intensive research on the causes of corrosion in various types of soils and developing methods to economically combat corrosion.

History of Pipe

Before the existence of the gas industry the only extensive use for pipe was in water distribution. The origin of cast iron pipe antedates the distribution of gas by several hundred years. Amid the difficulties attendant with popularizing gas, the selection of pipe materials followed the path of least resistance. The constructors of the original gas distribution systems, unable to secure small diameter cast iron pipe, used the only ducts readily available, which were wrought iron musket barrels. With the stabilization of the gas industry, more time was available for intensive study of manufacturing and distribution problems. These studies produced the conclusion that one of the major problems was to decrease the effects of corrosion. Before the gas industry was twenty years old, corrosion was an actively discussed subject, and tests were conducted on methods of mitigation. Due to lack of tangible incentives, intimate knowledge of the causes of corrosion were not extensively sought until the beginning of the present century. The rapid increase in main mileage during the past forty years, and the support given to individual observations by the general improvement in detailed records which furnished the basis for accurate determination of main life, provided the incentive for research. The general establishment of physical main records facilitated economic studies which indicated the actual effects of corrosion, the necessity for minimizing its effect, and the savings to be effected by protection.

While there has been considerable development in recent years in pipe manufactured from other than ferrous metals, the majority of companies continue the use of iron in one or more of its three common forms. For sub-surface work cast iron and steel are more extensively used than wrought iron. However, there are a variety of copper and alloy pipes manufactured and their advocates have indicated confidence by installing many miles of such mains.

Special Rate Plans and Rate Applications

A TIMELY report on special rate plans and rate applications such as objective rates, profit-sharing rates, service-at-cost rates, etc., has been prepared by the Rate Structure Committee of the American Gas Association. Copies have already been distributed to the delegates of member companies.

Departure from usual methods of rate application and the adoption in various places of special rate plans has been an outstanding recent development in the utility industry. Keen competition has caused the rate engineer to search for every conceivable method for building up business rapidly without impairing revenues. The objective rate plan which has received so much attention in The Commonwealth & Southern properties has been adopted by a number of gas companies. Likewise the sliding scale principle used in Great Britain for over eighty years has been modified and made use of in this country, notably in Washington, D. C., and Detroit, Mich. The New York Legislature recently legalized its use in that state. Service-at-cost rates providing for automatic adjustment with changes in cost of labor and materials are another comparatively new development. All of these are described in this report by the Rate Structure Committee, prepared under the direction of its Chairman, A. I. Phillips.

The report is entirely factual. A description is included of every objective rate, profit-sharing rate and service-at-cost rate, applicable to gas, in effect in the United States (so far as the Committee is aware) up to May, 1936. The operation of the rates is explained where necessary but no attempt has been made to determine their effect on consumption of gas or earnings since few of them have been in existence long enough to permit any sound conclusions to be drawn.

Copies of the report may be secured from Association Headquarters. Price to members $1.00; nonmembers $2.00.

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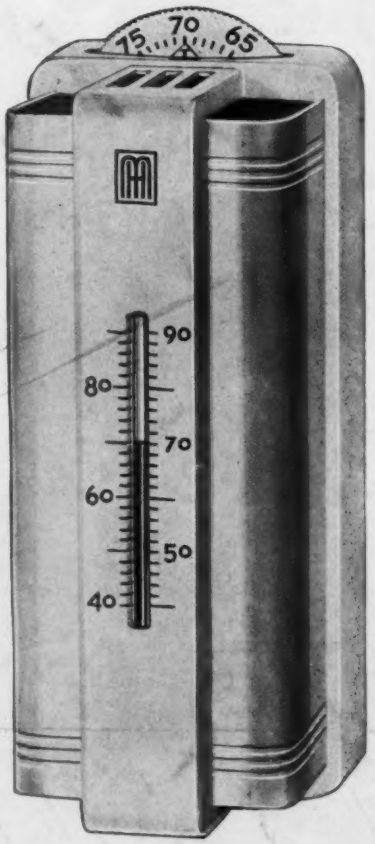

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